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Chemical Week

June 21, 1958

Connor, McClure: new MCA executive team sounds call to action in year ahead . . p. 22

Sulfur mine at sea. Freeport starts steel island seven miles out in Gulf . . . . . p. 29

Special Report: The next five years. For CPI, they're steps to the "Golden '60s" . . p. 51

Premium on technical papers. How firms encourage researcher authorship . p. 84

Process industry's wanted in northeast Texas — here are the lures . . . . . p. 105

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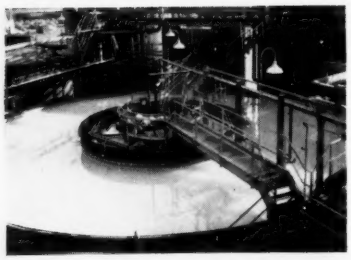

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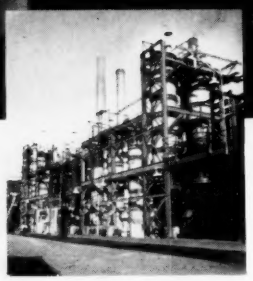

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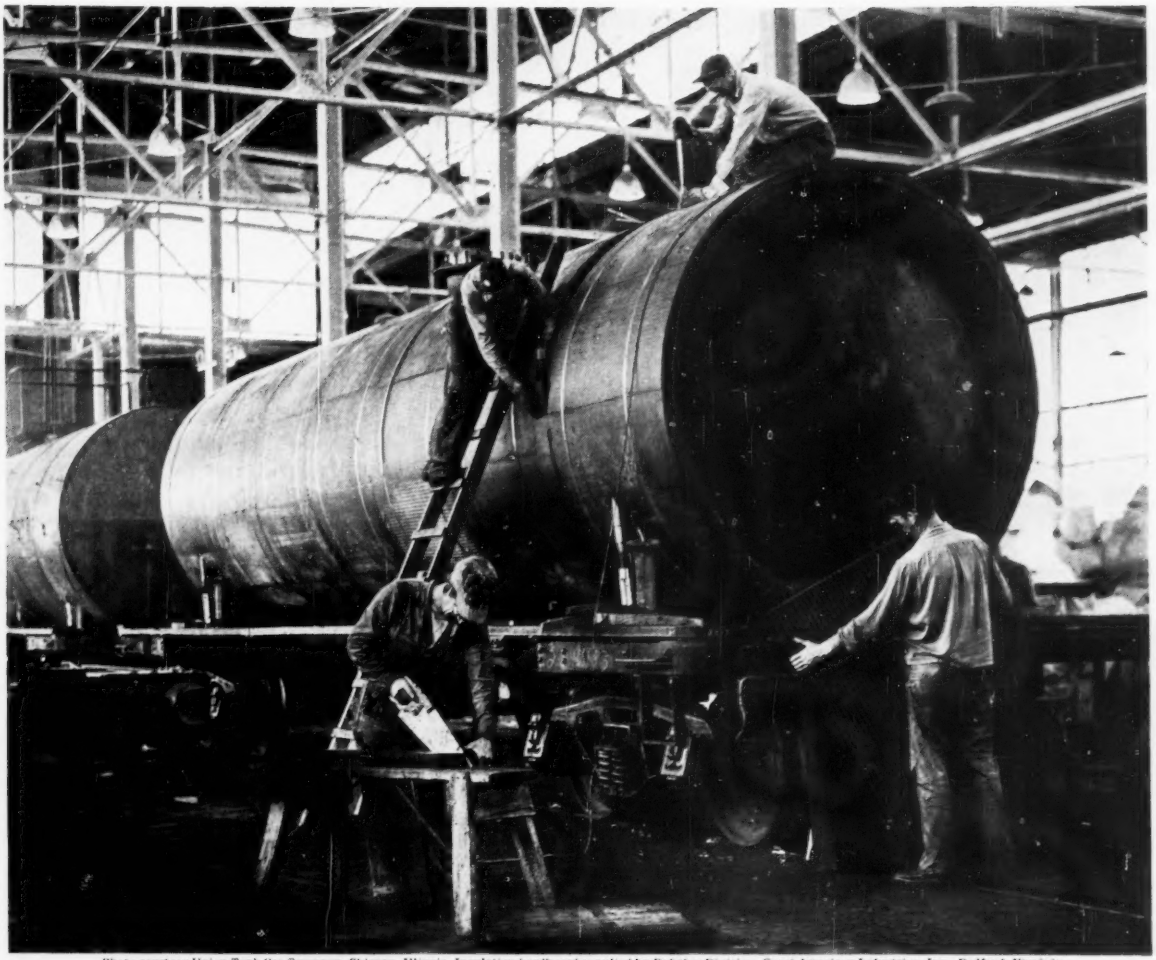

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Chemical Week

TOP OF THE WEEK **JUNE 21, 1958**

- **American visitors to Achema**—European "chemshow"—report on equipment offerings, value of show to U.S. observers . . **p. 63**
- **Pros and cons of standardized technical data sheets:** NIAA reports favorably, but some firms have reservations . . **p. 76**
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24 AEC adds new member; Congress seeks to speed U.S. Atomic projects.

25 Allied vs. Dixon technology-lawsuit consent decree: latter can build acid plants, provided no Allied technology is used.

25 Western grasshopper plague creates emergency market for pesticides.

25 Petrochemical operations in Louisiana threatened by new tax as state government ponders increased levy on natural gas.

29 ENGINEERING
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40,149 copies of this issue printed

Vol. 82
No. 25

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MIN CHEMISTRY *at work*

...news briefs

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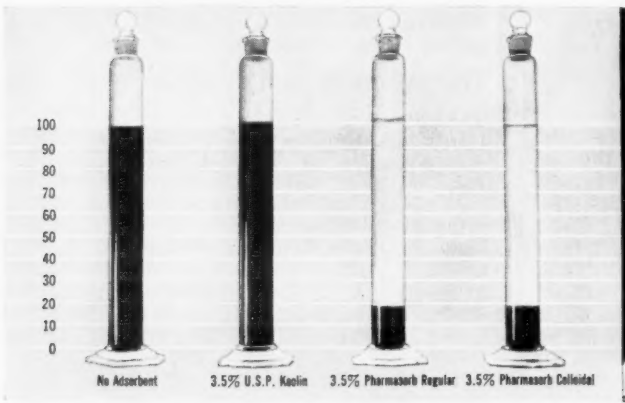
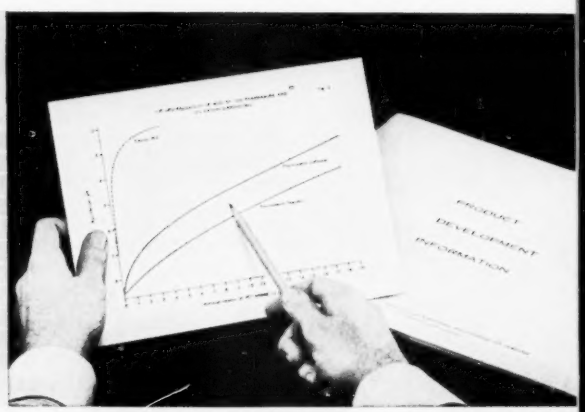
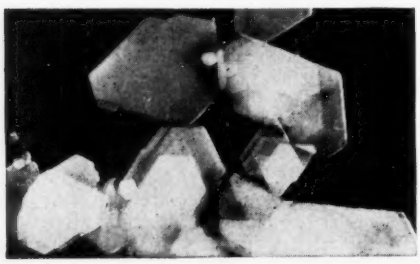




Printing Inks get top grinding and press behavior with new Surface Modified ASP's



M & C's new organophilic Surface Modified materials offer striking advantages in those ink systems requiring good flow and length. Viscous inks employing polar vehicles gain improved resistance to emulsification, excellent press behavior and printing qualities. Fluid inks benefit primarily from the distinctly superior suspension properties of Surface Modified ASP's. Whatever your requirements or type of vehicle, M & C offers quality-controlled extenders—the new Surface Modified organophilic types or unmodified hydrophilic pigments.

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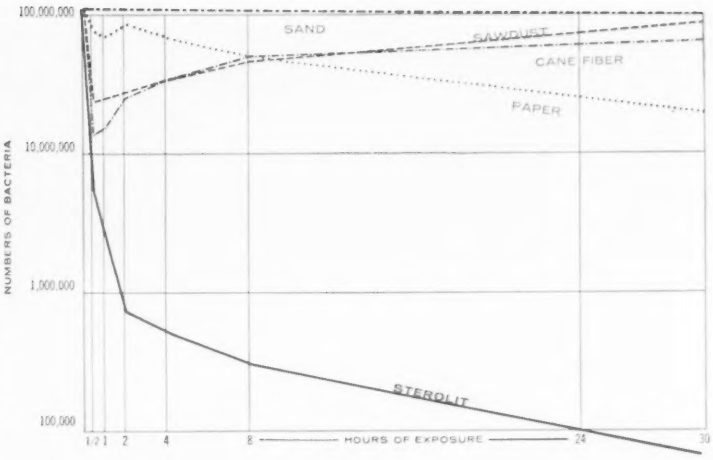

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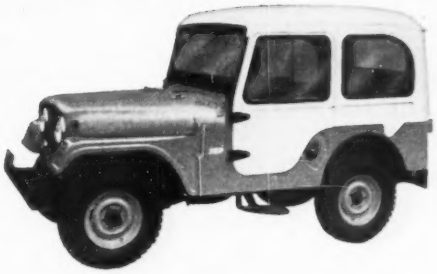

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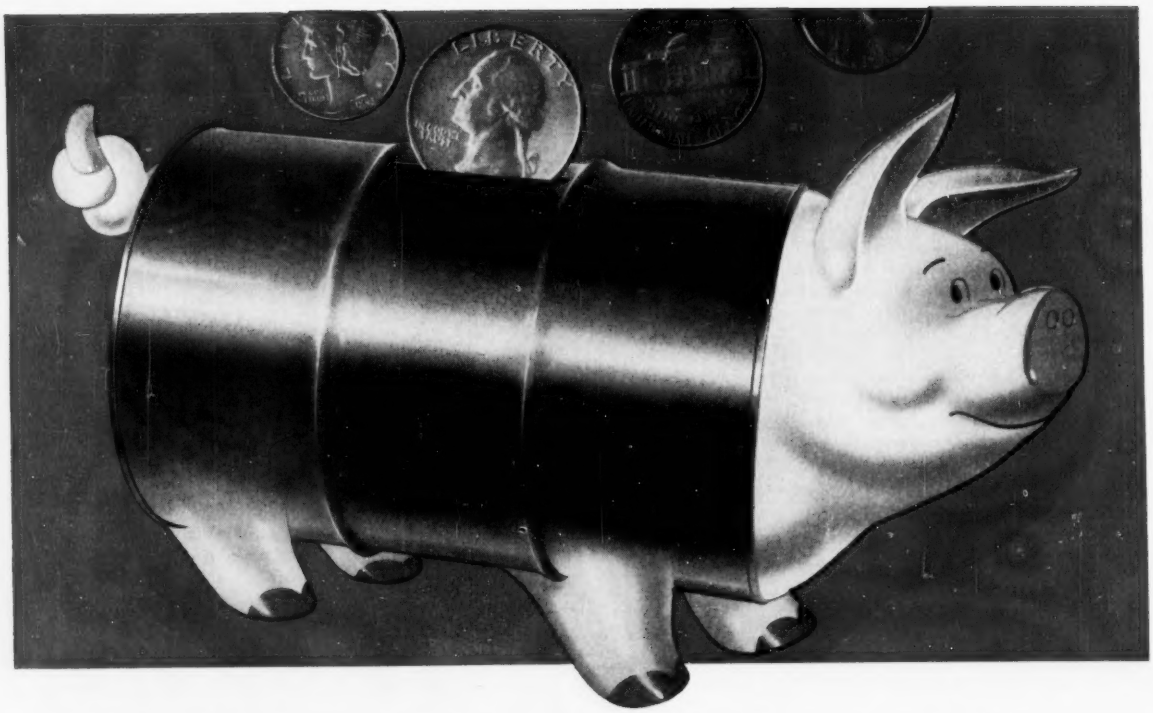

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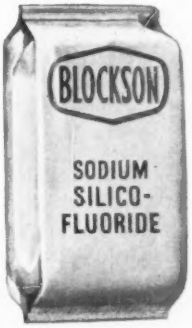

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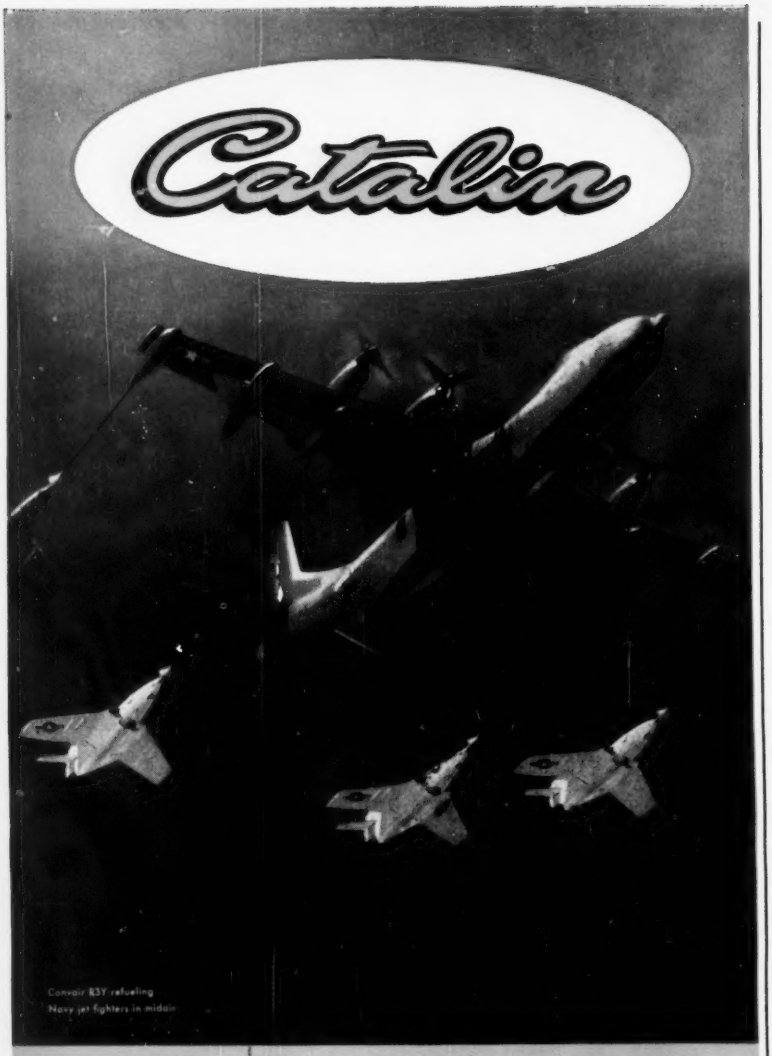

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OPINION

No Chemico Deal

TO THE EDITOR: I would like to call your attention to an item about Chemical Construction Corp. (*June 7, p. 14*) that we feel might be misunderstood or misinterpreted by your readers.

Describing the overtures being made to U.S. engineering firms by the Soviet Union, you report that Chemico has been approached indirectly to supply services for one particular type of plant, and that "the U.S. government o.k.'d the deal."

While it is true that Chemico was sounded out by the Russians through a Japanese firm, no decision was ever made by Chemico as to whether or not we would be interested in proceeding with such a project. Neither the Japanese nor the Russians were encouraged to follow up "with a concrete request."

Although informal inquiries were made to discover what position the U.S. government would take if we were to consider exploratory discussions with Soviet representatives or their intermediaries, Chemico, to this date, has never filed a formal application for permission to provide the Russians with any engineering information or services. Naturally, therefore, the U.S. government could not possibly have "o.k.'d the deal." It is probably the lack of a clear-cut negative answer that has led some to interpret the government's attitude as affirmative. . . .

THEODORE PECK
Chemical Construction Corp.
New York

Grebe Outgrabe?

TO THE EDITOR: I was very much interested in the news item . . . (*May 3, p. 55*) regarding Dr. John Grebe's paper at the recent meeting of New York Academy of Sciences. Of particular interest to me was Dr. Grebe's proposal "that the basic particles of matter consist of the electron and the positron, respectively . . . and that all other larger particles are made up of multiples or combinations of the two."

The reason that this paper strikes me of particular interest is that in 1938, as an undergraduate student at McGill University, I . . . published at my own expense a small brochure

From CARBIDE'S Solvent Center . . .

Solvents to fit your formulation —just specify the properties you need

Among the high-quality glycol-ethers, esters, alcohols or ketones available from CARBIDE, there is one—or a combination—that is just right to give your product the best balance between cost and performance.

Your solvent might be one—or several—of CARBIDE's 11 CELLOSOLVE and CARBITOL glycol-ethers. Their non-foaming property, high solvent power, low viscosity and low degree of odor make this group of solvents suitable for use in easy-spreading, color-retaining latex paints. If you use esters in your formulation or process — you have a choice of 25 CARBIDE esters — for example, ethyl acetate, isopropyl acetate, or butyl acetate. And, for a wide range of applications—from lacquers to drug extraction—there are two dozen alcohols and 14 ketones available from CARBIDE.

Whatever your product, there is a trained Technical Representative ready to help you select the solvent that's best for your application. You can balance your inventory and production schedules by ordering the quantities you need, quickly shipped in drums—LCL or carload lots, in tank wagons, in compartment tank cars, or 4,000 to 8,000-gallon tank cars from one of our warehouses, bulk storage stations, or plants—a total of 72 shipping points—across the country.

To help you choose the best solvent, coupler, plasticizer or diluent for your requirements, we've prepared a six-page booklet, the "Solvent Selector." Ask for a copy from your Technical Representative or write Union Carbide Chemicals Company, Division of Union Carbide Corporation, Room 328, Dept. H, 30 East 42nd Street, New York 17, N. Y.

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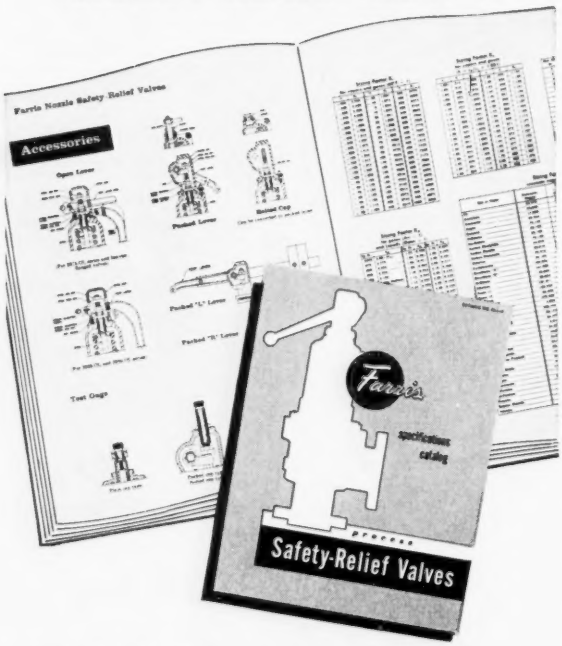

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- Complete data on all Farris Standard and BalanSeal valves for process piping
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suggesting that "the atoms of all the elements are made up fundamentally of positrons and electrons only." Surprisingly, just 20 years ago, the editor of every scientific journal to which this treatise was offered rejected it on the grounds that it was preposterous and completely untenable. I am enclosing a copy . . . in the belief that you would be interested in seeing the similarity between it and the current ideas on the structure of matter . . . now being accepted by the nation's leading physicists.

O. A. BATTISTA
American Viscose Corp.
Research and Development Division
Marcus Hook, Pa.

Friction About Mills

TO THE EDITOR: We have noted with interest an article titled "Frictionless Mill" (*April 12, p. 72*). . . .

The claims of the mill mentioned in your article are incorrect on several counts: first, it is not the first commercial frictionless mill, nor do we make such claim for our Jet-O-Mizers; second, the term "frictionless" is an erroneous, or at least misleading, name.

The relatively low production rate of the mill renders it useful only in laboratory-scale studies. Our laboratory-model 0202-2 mill will produce a product with a particle size less than that indicated for the Spinco mill at a production rate double that indicated for the subject mill and, in the case of very difficult and abrasive materials, at a rate five times greater than the Spinco mill. . . .

JOSEPH P. MCKENNA
Manager
Fluid Energy Processing & Equipment Co.
Philadelphia

Out With 'Oleo'

TO THE EDITOR: . . . You state (*April 19, p. 112*) "Additive Makers Fatten on Oleo Increases." What is "oleo"?

About a century ago, Napoleon III offered a prize for a butter substitute. The prize was won by a French chemist named Mege-Mouries. It was called Oleo Mege-Mouries (oil of Mege-Mouries), which was anglicized to oleomargarine.

The butter substitute was a com-

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"Service" is a big word at AMSCO—a word with a double meaning for every AMSCO customer.

1. "Service in 48 states" means that wherever your plant is located, AMSCO can deliver solvents right to your door quickly, economically. No matter how you order, by the barge, tank car. tank wagon, or a drum at a time, AMSCO's nationwide network of terminals, refineries, and storage depots gets the shipment to you fast.

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pound of mutton fat with greases and vegetable oils, a greasy product, but with a melting point higher than that of butter. I am certain that no material of this kind has been manufactured in this country for many years. You will find the word "oleo" in old agricultural laws, and for years the butter manufacturers used the term as a word of contempt in pushing through state and federal restrictive laws. The slow-moving Dept. of Agriculture has not yet corrected its records . . .

GEORGE S. BRADY
Bethesda, Md.

Industrial Parks

TO THE EDITOR: I have just finished reading your very excellent article (*April 26*) concerning the applicability of the industrial park principle to certain chemical industries. I thought it was excellent coverage of the subject and a significant contribution to site-location thinking in regard to chemically oriented plants. . . .

RICHARD T. MURPHY, JR.
Arthur D. Little, Inc.
Cambridge, Mass.

MEETINGS

Gordon Research Conferences, series of 36 topics, Colby Junior College, New Hampton School and Kimball Union Academy, all in New Hampshire, ends Aug. 29.

American Chemical Society, Division of Medical Chemistry, sixth national symposium, University of Wisconsin, Madison, June 22-25.

American Society of Agricultural Engineers, annual meeting, University of California, Santa Barbara, June 22-25.

American Society for Testing Materials, annual meeting and exhibit, Statler Hotel, Boston, June 22-27.

American Institute of Chemical Engineers, 50th anniversary celebration, Bellevue-Stratford Hotel, Philadelphia, June 22-27.

Society of the Plastics Industry, Midwest section conference, French Lick-Sheraton Hotel, French Lick, Ind., June 26-27.

CERN, annual conference on high-energy nuclear physics, Geneva, Switzerland, June 30-July 5.

American Soybean Assn. and **National Soybean Processors Assn.,** joint annual meeting, Fort Des Moines Hotel, Des Moines, Iowa, Aug. 18-20.

Everyone under the sun uses Cellulose

These people are having too much fun to think about cellulose. But, if they only knew:

Those swim suits will retain their shape and color better because they're made from acetate and viscose rayon, both products of cellulose. The radio and eyeglass frame are lighter and more colorful, thanks to shock-resistant cellulose plastics. Even the frankfurter has a cellulose casing and the camera uses film with a cellulose base for clear, sharp photographs. Cigarette filters, cellophane, rayon cord tires, rayon fabrics and countless other products also depend on cellulose.

As industry's oldest producer of this versatile material, we're proud of our record as pioneers in cellulose. And pioneering never ceases at Buckeye. Through continuous research in cellulose, we are helping industries to develop new products and make existing ones better.

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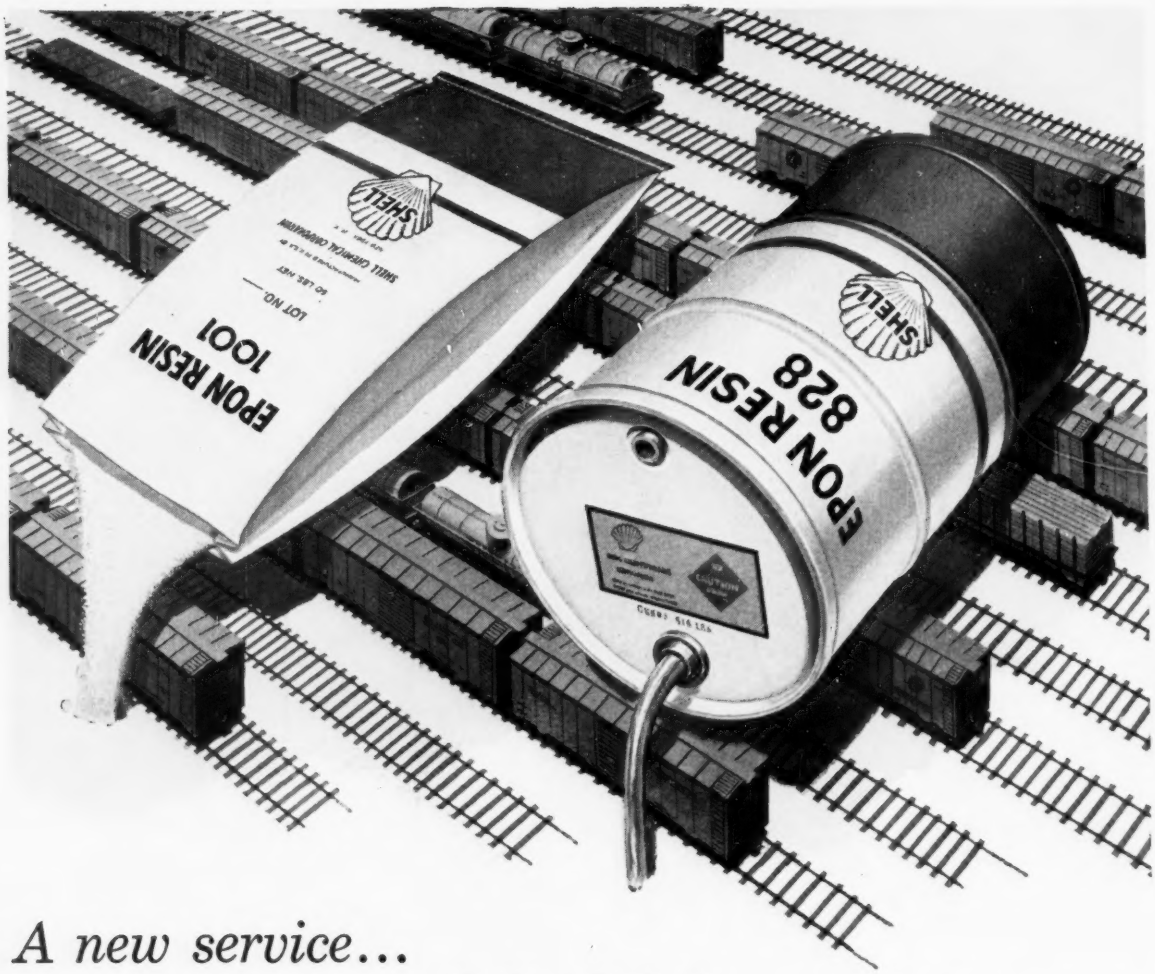

A new service...

Epon® Resin in 30,000 pound lots...

for substantial savings!

Here's welcome news for production men who want to bring down the cost of maintaining uniformity of their products! Now, each of six different types of Epon resin are available in single manufacturing lots of 30,000 pounds. These include Epon 815, 820, 828, 1001, 1004 and 1007.

HERE'S HOW carload lots offer SAVINGS:

1 You save substantially in time and labor on inventory control—in addition, Shell's "one-man lift" 50-lb. paper bags for Epon 1004 and 1007 help speed in-plant handling . . . and are color-coded for instant identification of contents.

2 You save control lab time—only one evaluation of incoming resin is needed per carload, whereas small lot production may require 8-10 analyses.

3 You cut manufacturing costs by increasing the uniformity of raw materials used in your products, thus reducing the day-to-day adjustment of formulations to account for batch variation in ingredients.

For additional information, write to the Shell Chemical district office nearest you.

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SHELL

Business
Newsletter

CHEMICAL WEEK
June 21, 1958

This is merger week for several process companies:

• Vick Chemical (New York) plans to boost its share of the vitamin, nutritional and ethical drugs field by acquiring Walker Laboratories, Inc. (Mount Vernon, N.Y.), through a stock exchange. Vick wants to exchange up to 43,680 shares of its common for 466,721 shares of Walker Class A or B (a 9-to-100 ratio) and would pay $50, plus dividends, for 258 shares of Walker preferred.

Walker, with its line of about 85 vitamin and nutritional specialties, antibiotics and other drugs, last year chalked up earnings of $123,234 on sales of $2.2 million. Vick's sales for the nine months ending March 31 were $86.1 million; earnings, $9.5 million. Walker will retain its identity as an operating division.

• Allied Laboratories, Inc. (Kansas City, Mo.), also proposes a merger—with Campana Sales Corp.—through exchanging stock. The drug firm has filed for a new, 65,000-share common stock issue, to be exchanged for 9,291 outstanding shares of the Batavia, Ill., company. Campana, a proprietary drugs and cosmetics producer, would become an Allied subsidiary. First National Bank of Chicago, which now holds Campana stock in a trust agreement, would get 49% of the new shares.

• Chemetron Corp. plans to take over a Chicago meatpacking machinery and equipment maker, Allbright-Nell Co., Inc., by acquiring all its stock in exchange for 70,000 shares of common—worth about $2.4 million. The machinery company, which has a 200,000-sq. ft. plant, would operate as a Chemetron subsidiary. Production and sales would be coordinated with Chemetron's Girdler Division.

• Kaiser Industries' Permanente Cement Co. (Oakland, Calif.) has offered $8.57/share for the 1 million outstanding shares of Olympic Portland Cement Co. (Seattle), a 64%-owned subsidiary of United Molasses Co., Ltd. (London). Olympic's 1.7-million-bbls./year cement plant in Bellingham, Wash., would boost Permanente's capacity 16%.

• Purex Corp., Ltd. (South Gate, Calif.), last week gained 90% control over Allen B. Wrisley Co. (Chicago), toilet-soap maker, through a stock exchange—one share of Purex common for six of Wrisley's common. Wrisley's sales last year were about $6.5 million. Purex, for the fiscal year ending June 30, '57, reported sales of $50.3 million.

•

Imperial Chemical Industries is taking the Russians up on their bid for Western chemical equipment and know-how (*CW, June 7, p. 13*). A Soviet source told *CW* that the British firm has offered Terylene (polyester fiber) production information for $9 million. Said the Russians: ICI was asking $15 million a year ago and "is still asking at least three times too much." ICI has been negotiating with the Russians for four

years on the process, but talks have been stalled for the past several months.

•

Rising chemical stock prices are apparently reflecting optimism by some investors who think an economic upturn will come sooner and will be stronger than generally expected.

Prices of chemical, pharmaceutical and other process industries' stocks generally were steady or up last week. During the preceding week, average gains in stock prices for five process industries—industrial chemicals, drugs and medicines, paper and allied products, petroleum refining and nonferrous metals—were all above the composite price increase on the New York Stock Exchange.

Among individual company stocks, the top gain from April to May was by Hooker Chemical, whose stock price rose 16.4%. This climb probably was related to Hooker's recent acquisition of Shea Chemical. Other sizable gains: American Potash & Chemical and Spencer Chemical —whose stock prices were up 8.5% last month.

Of the largest chemical companies, Allied Chemical made the top showing on the bull market with a 2.7% stock price increase from April to May. Allied says its sales and earnings in April and May were above the first-quarter rate. With improvement continuing in June, income for the second quarter is expected to more than cover the 75¢ dividend.

•

One stock whose price has rocketed is that of E. L. Bruce Co. (Memphis, Tenn.), maker of hardwood flooring and various chemical specialties. When the price mounted from $17/share in March to $77 late last week, trading was suspended and the American Stock Exchange began an investigation to find out if enough shares are outstanding and publicly held to warrant continued trading.

It's known that a proxy battle is on, at Bruce, with Edward Gilbert, of Empire Millwork Corp. (New York), heading up the insurgent group. Gilbert reportedly has attained control of 54,460 shares—less than 20% of all outstanding stock.

•

Interhandel—Swiss holding company—still has a fighting chance to regain its majority interest in General Aniline & Film Corp. U.S. Supreme Court ruled this week that the lower courts erred in dismissing Interhandel's suit to recover GAF stock that the U.S. government had seized early in World War II as enemy-controlled.

The case now goes back to U.S. district court in Washington. But Interhandel still has the burden of proof that it was not a "cloak" for Germany's I. G. Farben chemical cartel.

BRIEFS for buyers of

Trichlorethylene
Muriatic Acid
Chlorobenzenes
Nitrobenzoyl Chlorides

You name the use— We name the grade.

You name the application for Nialk® Trichlorethylene and let us name the grade most suitable.

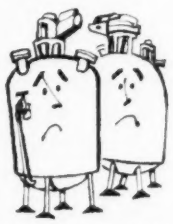
For many chemical uses, such as solvent extraction, organic intermediate, special flame-proof solvent, and others where trichlorethylene is desired, one of our several grades is sure to fill the bill.

By far the greatest use is for the MD grade for vapor degreasing. This product, with its unique system of neutral stabilizers, is a recognized standard in the metal industry. Nialk MD Trichlor has *psp, permanent staying power.*

If you have a special use or problem in mind, let us know. We'll be glad to offer recommendations as to the grade of Nialk Trichlor you can use. For a technical data sheet with specifications of all grades, check the coupon.

Is the wrong kind of muriatic giving your process indigestion?

A lot can go wrong when the muriatic acid you use isn't quite good enough for your process:



Sulfates in muriatic, for example, could gum up your process with an insoluble precipitate when you work with something like benzidine dyes. Or they could cause serious extraction losses if you're refining certain high-grade metals, such as radium.

Iron impurities can make a white product turn yellow.

Arsenic can form toxic arsine gas during metal pickling.

Free chlorine can sometimes oxidize valuable process materials.

What can you do? If your process is sensitive to any of these impurities, you can make it perk more efficiently with Hooker White Muriatic.

Hooker White is probably the purest muriatic acid you can buy anywhere in large volume. It holds a mere 0.0001% iron; less than 0.003% sulfates; *no* free chlorine; *no* arsenic.

The specs on Hooker Commercial Grade muriatic are only slightly less rigid: 0.0005% iron; 0.003% sulfates; a trace of free chlorine; *no* arsenic.

For technical data on either grade, just check the coupon.

Chlorobenzenes . . . five are Hooker specialties

Five chlorobenzenes are currently available from Hooker in large or small quantities.

Monochlorobenzene. Typically 99.5% pure as determined by cryoscopic methods. Available in tank cars or 55-gal. drums.

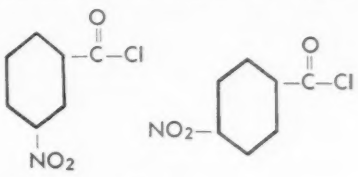
ortho-Dichlorobenzene, Technical. 85% to 87% pure *ortho,* most of the rest being para-Dichlorobenzene. Available in tank cars or 55-gal. drums.

para-Dichlorobenzene, 100% pure. Available in seven mesh sizes. Shipped in fiber drums of 200, 100, 50 and 25 lb. net.

Trichlorobenzene, Technical. A mixture of 1,2,3- and 1,2,4-isomers with 1,2,4- predominating. Shipped in tank cars or 55-gal. drums.

1,2,4,5-Tetrachlorobenzene. Chlorine content is 65.7%. Available in fiber drums of 200-lb. net.

For more information on any of these chemicals, including physical properties and specifications, send the coupon.



Two versatile aromatic chlorides

These exclusive Hooker compounds give you practical ways of putting nitrobenzoyl groups into organic compounds.

The *m*-nitrobenzoyl is 92% pure *meta.* The *p*-nitrobenzoyl is 98% pure *para.*

Both products are available in 55-gal. drums or 5-gal. containers.

The coupon offers technical data sheets on both these products as well as two other aromatic chlorides, benzyl and benzoyl chloride.

For more information on all chemicals mentioned, check here:

- ☐ Trichlorethylene, all grades
- ☐ Muriatic Acid
- ☐ Monochlorobenzene
- ☐ *ortho*-Dichlorobenzene
- ☐ *para*-Dichlorobenzene
- ☐ Trichlorobenzene
- ☐ 1, 2, 4, 5-Tetrachlorobenzene
- ☐ *m*-Nitrobenzoyl Chloride
- ☐ *p*-Nitrobenzoyl Chloride
- ☐ Benzyl Chloride
- ☐ Benzoyl Chloride

Clip and mail with your name, title, and company address. Use business letterhead when requesting samples.

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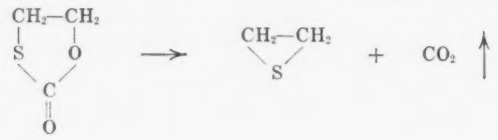
Presto, ethylene sulfide

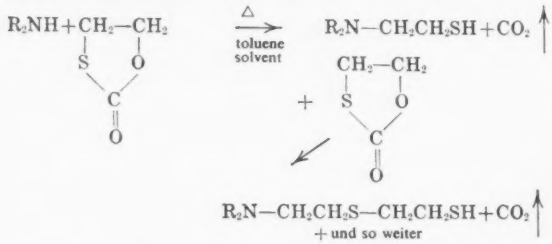
Talk about your polymer success stories. Polyethylenesulfide $(-CH_2CH_2S-)_n$ is one that never made good. Nor for want of trying. Been subject of much literature. Few suitable solvents. Monomer, ethylene sulfide (CH_2-CH_2 with S) is clear, volatile liquid (BP 56). Doesn't stay that way long. May[illegible] a day if you play your cards right. Used to be prepared by reacting 2-chloroethylmercaptan with sodium bicarbonate. Ethylene sulfide has to be fractionated from the water. Most of it polymerizes on the way. Russians do it by reacting ethylene oxide with potassium thiocyanate. Long drawn out and messy. Tried it here and got nowhere near the 25-50% yields they claim. May be our fault.

Anyway, spent long time looking for better idea. Wound up inventing "new composition of matter." Call it *Ethylene Monothiocarbonate*. Nice, smelly but stable liquid. Keeps long time below 200 C. Get it that hot and presto, ethylene sulfide. So:



96% yield.

Ethylene sulfide long considered *sine qua non* of mercaptoethylation. Now you can mercaptoethylate *sine*. Life thus made simpler, more satisfying, safer because at temperature required for attachment of $-CH_2CH_2SH$ group, ethylene sulfide is far above boiling point but *Ethylene Monothiocarbonate* is not. Reaction proceeds peaceably without pressure plumbing and all that jazz. Mercaptoethylation might be pushed onward and onward. Viz.,



Long polyethylenesulfide side chains have been hooked onto NH_2 or SH groups of proteins and onto the OH groups of cellulose. Also talk in literature of entwining natural polymer chains with polyethylenesulfide chains formed *in situ* but not bonded to them.

Glad to sell you *Ethylene Monothiocarbonate*. From $3.10 for 10 grams on up in quantity and down in price. Ask for Eastman 7367.

Unfetid imagination

Across the continent year in and year out rumble the trucks and boxcars bringing to our parent silver ingots for his photographic emulsions. Nobody is as interested in silver as he. At this year's Pittsburgh Conference on Analytical Chemistry, three of his chemists told how rapidly, simply, and well-nigh automatically they titrated it using a silver sulfide-calomel electrode pair with a solution of *Thioacetamide* (Eastman 1719), the unfetid, up-to-date source of sulfide ion for the analyst. They have worked the method with mercury as well. The mercury is complexed by ethylenediaminetetraacetate, the silver by thiosulfate. If some other heavy metal meant as much to you as silver and mercury do to these chaps, you would ask us for an abstract of their presentation and then try to imagine the proper indicator electrodes for *your* metal.

Glucosamine

Because of an item we read in the *Wall Street Journal* recently, a copy or abstract of which we refuse to supply, we predict that this year will see an upsurge of interest in the biochemistry of glucosamine.

This amine sugar is easy to prepare. The classical starting material is chitin, and the essence of the method is acid hydrolysis. Chitin can be obtained in several ways. Perhaps the most efficient of these is to go around to the back door of the most prosperous sea food restaurant within easy reach and talk to the official in charge of the garbage cans about a deal for his vacant lobster shells. A slower method is to put shrimp on the family menu as often as necessary and save the peelings. Investigators with a distaste for sea food can get their chitin at this season of the year by putting a corps of small boys to work hunting June bugs (May bugs, that is, in the South).

For those who shun behavior tending to mark them as colorful scientific personalities, there is still another alternative. They can purchase ready-purified D-*Glucosamine Hydrochloride* as Eastman 644. Foreseeing the demand from the shy ones, we have laid in a stock of clean chitin that looks like breakfast food or perhaps fingernail clippings.

Each one of the 3600 or so Eastman Organic Chemicals available from *Distillation Products Industries*, Rochester 3, N. Y., has its own story.

Price is subject to change without notice.

DPi

Eastman Organic Chemicals

Also . . . vitamins A and E in bulk . . . distilled monoglycerides

Distillation Products Industries *is a division of* **Eastman Kodak Company**

This new packaging idea created an $85,000,000 market

Here's a simple packaging idea with the power to completely change consumer ideas of how a product should perform. Aerosol packaging created an $85,000,000 market for hair fixatives and has revolutionized sales for insecticides, shave creams, colognes and a host of other products. If your product can be brushed, poured or sprayed, you might add new consumer appeal—create a positive competitive advantage if you packaged it in an aerosol.

Sales records and marketing data prove the appeal of aerosol packaging. In a recent survey of the market for hair preparations, 95% of users preferred the aerosol hair fixative and 83% of users preferred aerosol hair dressings. The main reason for each was that aerosols deliver the product in a completely new form—a form that's easier and neater to apply than similar products in conventional packages.

Put the unique advantages of aerosols to work for your products. It's surprisingly simple and inexpensive to have your formulation packaged for testing. Custom fillers near you have the knowledge and equipment to do it for you.

If you don't know the name of a custom filler, write Du Pont. We'll send you a list and include survey data on your market for hair products plus information about Freon* propellents for aerosols. More of today's successful aerosols are powered with "Freon" than with any other propellent. Write E. I. du Pont de Nemours & Co. (Inc.), "Freon" Products Division 3362, Wilmington 98, Delaware.

Best-selling aerosols are powered with

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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

*FREON AND COMBINATIONS OF FREON- OR F- WITH NUMERALS ARE DU PONT'S REGISTERED TRADEMARKS FOR ITS FLUORINATED HYDROCARBON PROPELLENTS.

Carbide's McClure (left), Merck's Connor: New MCA officers map more active public role for industry.

New MCA Chiefs Sound Call to Action

Individually and collectively, Manufacturing Chemists' Assn.'s 160 member companies will be more active in public affairs during the coming year than ever before. This theme was sounded during the two-day, 86th annual meeting of MCA, held late last week at White Sulphur Springs in West Virginia's scenic Allegheny highlands.

A record turnout of more than 750 top executives of the nation's leading chemical companies heard addresses by all three of the organization's chief officers: Union Carbide Vice-President Harry McClure, new chairman of MCA's board of directors; Merck President John Connor, who succeeds McClure as chairman of the association's executive committee; and General John Hull (USA, Ret.), re-elected full-time president and director.

For Better Business Climate: McClure told *CW* that although the industry's No. 1 problem—the current squeeze on profits—is one that the companies must largely cope with singlehandedly, MCA will be doing all it can to help improve the overall economic climate.

For one thing, he noted, MCA can continue to suggest constructive legislation to Congress. In recent months, MCA representatives have testified on "good faith" pricing, food additives, reciprocal trade, antidumping and numerous other issues.

Says McClure: "We hope to continue and perhaps increase these activities in the coming year."

International Lever: Connor stirred delegates with his proposal for "a bold new foreign medical aid program" as a potentially powerful addition to this country's international aid policy.

In his provocative speech on "The Global War Against Disease," the Merck president called on individual companies to step up their medical research programs. He challenged the Soviet Union to enter into a race with the U.S. to see which nation can first raise the average life expectancy of its people to 75 years. (As of 1956, the U.S. average was 69.5; Russia's, 67.)

Connor urged that universities and institutions also increase their research activities, recommended that the U.S. government put more money into broad research programs, as opposed to specialized drives against specific diseases.

"The $400 million a year spent on medical research is less than one-tenth of 1% of the gross national product," Connor declared. "Raising this figure is easily within our reach."

More Government Liaison: In his report to the members, Hull told of increased liaison with the government over the past year. "It is becoming increasingly important," Hull stated, "for industry to be more active in government and politics."

Among highlights of the association's service to the industry during the 1957-58 period, Hull said, was formation of two new committees. One will analyze chemical industry insurance practices; the other is working on standard chemical-nomenclature abbreviations for use in office-machine accounting.

Recession No Dampener: Contrary to some expectations, recession didn't bring a downturn in attendance at this biggest event on the industry's calendar. Some 763 chemical executives converged on the resort town—about 60 more than last year.

So popular was the convention that three extra cars were added to a White Sulphur Springs-bound train leaving 40 minutes after the all-bedroom-and-roomette special that pulled out of New York's Pennsylvania Station late last Wednesday.

Many other delegates planed to Roanoke, Va., went on by special air taxi. Scores of others arrived in their own company planes.

Punctuality: Most of the business docketed for the meeting was transacted at the Thursday morning session presided over by Food Machinery and Chemical President Ernest Hart, the association's incumbent chairman. This period got under way promptly at 9:30 a.m., even though many delegates, who had just got off the train, were still milling around the hotel lobby, waiting for their room assignments.

On Thursday morning, delegates unanimously balloted for McClure, Connor and Hull, heard Hull's presidential report, and witnessed presentation of safety awards (to U.S. Rubber, Royce Chemical, and Tennessee Corp.) and education awards (to outstanding college chemistry instructors).

But the big event that morning was Connor's idea-packed speech, illustrated with a series of charts flashed on the screen in front of the audience. In analyzing Russia's progress in health and medicine since the 1917 revolution, Connor concluded that the weakest part of the Soviet medical system is its state-owned pharmaceutical industry.

Lack of Discovery: As for new drugs, Connor said, "I have searched rather diligently and have yet to unearth a single important one that the Russians have developed on their own. They admit this. In the summer of '56, the official text of their five-year plan for pharmacology made the following uncharacteristic confession: 'In the search for new therapeutic agents, (the Soviet Union) still lags behind the large capitalistic countries'."

Connor's suggestion that "medicine should be put to work for freedom all over the world" drew immediate response from MCA delegates. Du Pont President Crawford Greenewalt—joining Connor in a *CW* interview—remarked that he has often been critical of how U.S. foreign-aid money has been used, but that "this would be putting it to excellent use."

Relaxation: Aside from the business and speaking sessions, the outing gave executives an opportunity for nearly a day and a half of relaxation. With the sun shining both days, the Greenbrier Hotel's two 18-hole golf courses were in full use.

Another popular spot was the Greenbrier Gun Club, about a mile off the hotel grounds, where many spent time skeet-shooting. There also was horse-riding, tennis, and swimming in the hotel's outdoor heated pool.

Final scheduled event was Friday evening's banquet at which Office of Defense Mobilization Director Gordon Gray called for support of the President's plan for reorganizing the Defense Dept. He stressed that we must keep defenses strong.

MCA officials rated this convention "the most successful ever"—and forthwith began mapping plans for next year's big meeting at the same site.

In golf and guns, a golden opportunity for a day and a half of sun-filled recreation.

WIDE WORLD

California's McCone: Inheriting the quarrel on industry's role in atomics.

New York's Hilyard: Taking his turn as head of 10-firm atomic venture.

Partisan Push for Speedup

More nuclear ventures open to private industry and stepped-up government atomic activity are in prospect for the fiscal year beginning next month.

The Democrats, who control Congress, are expected to approve President Eisenhower's nomination of California industrialist, John McCone, as member—and probably chairman—of the AEC. McCone succeeds Admiral Lewis Strauss (whose term expires at the end of this month). And it's a good bet that he will enjoy better relations with Congress than did Strauss.

But the Democrats' willingness to do business with McCone is not going to keep them from driving for a more ambitious federal atomic program. A clash is shaping up, with McCone likely to adhere to Strauss's policy of opposition to federal construction of atomic facilities whenever there's a chance that private industry will do the job.

Company Partners: One example of how the Republican-led AEC seeks to put as much atomic development as possible in private hands is the commission's action last week approving transfer of a reactor research project to Industrial Reactor Laboratories, Inc. IRL is an association of 10 large industrial firms that will share the equipment for a variety of experimental atomic energy projects.

Currently headed by Harry Hilyard, vice-president and treasurer of American Tobacco Co., IRL has six chemical process concerns on its membership roster: Atlas Powder, Corning Glass, National Distillers and Chemical, National Lead, Socony Mobil Oil, and U.S. Rubber. The 5,000-kw., pool-type reactor—now nearing completion near Princeton, N.J.—is being built by American Machine & Foundry's AMF Atomics Division.

Democrats Dissatisfied: But key Democrats on the Joint Committee on Atomic Energy feel that AEC's "partnership" approach—under which industry is encouraged to take on nuclear projects with government help—has thus far failed to produce results fast enough to maintain this country's world leadership in science and industry.

For the 12 months starting July 1, the Administration program calls for federal construction of one big reactor—a 40,000-kw., gas-cooled type costing some $51 million. AEC officials have publicly set their sights on making atomic power competitive with conventional power within 10 years in the U.S.; for friendly nations where conventional power generation is more costly, the goal is five years.

Committee Democrats, such as Sen. Clinton Anderson (N.M.) and Sen. Albert Gore (Tenn.), say this is fine as far as it goes. But they believe that AEC still is leaning too much on private enterprise to do the job; and they want greater federal participation, starting this coming fiscal year.

Five-Year Push: Accordingly, the Democrats are drawing up a program of their own. It's expected to call for construction of up to 1 million kw. of atomic-generating capacity in the next five years. It will probably extend the "partnership" policy—but under tighter rules meant to ensure that AEC will specify the most promising types of reactors to be built and to guard against long delays on federal reactor construction if private enterprise doesn't act with alacrity.

The Democrats' proposal for the 1958-59 fiscal year is expected to call for:

- More AEC encouragement of construction of process-heat reactors under the cooperative program.
- Construction of materials and engineering test reactors, at a cost of $35 million.
- Construction of at least one federal reactor, and possibly two, to produce plutonium—a key ingredient in nuclear weapons.
- Design of two advanced types of boiling-water and pressurized-water reactors, utilizing all known nuclear technology.
- Construction of a heavy-water-moderated and cooled reactor using natural uranium. (Democrats may not insist on this in view of AEC's plans to build a heavy-water components test reactor next year.)

As to the first point—construction of process-heat reactors—AEC has said one or more pilot plants may be started in the next five years; but the agency asserts that industry has shown little solid interest in participating.

The Democrats think more could be done. Last week, one of their spokesmen — Rep. Chet Holifield (Calif.)—read a telegram from Michigan Chemical Corp. in which the company said it would seek U.S. help on a small, $2.5-million reactor to produce heat for the company's St. Louis, Mich., plant. Such a reactor, according to the telegram, would produce heat more cheaply than oil and gas heating systems.

Know-How on Docket

Important new precedents on property rights involved in chemical technology and market data are emerging in four private lawsuits that were in various stages in the federal courts last week.

• At Newark, N.J., Allied Chemical and Dixon Chemical entered into a consent decree that permits Dixon to proceed with its current expansion projects—sulfuric acid, aluminum sulfate and hydrofluoric acid—but without using Allied's know-how.

• At Washington, U.S. Court of Appeals—having just ruled that the Constitution does not prevent Atomic Energy Commission from making public the heavy-water process invented by Jerome Spevack—is weighing a new decision: whether to continue to bar publication of the process, giving Spevack a chance to appeal to the Supreme Court.

• At Baltimore, Chief Judge Roszel Thomsen has heard testimony and arguments on Carter Products' suit for further limitations on composition of Colgate-Palmolive's pressurized shaving cream. Thomsen's written opinion is expected next month.

• At Salt Lake City, there will be a month's delay in entry of final judgment in Monsanto Chemical's suit to keep Central Farmers Fertilizer Co. from using Monsanto know-how in building an elemental phosphorus plant. Reason: trial judge A. Sherman Christenson has been assigned temporarily to the log-jammed district court in Washington.

Expansion to Proceed: Dixon President Arthur Dixon, Jr., told *CW* that his company intends to move ahead with the three expansion projects announced earlier this year (*CW, March 22, p. 24*).

The consent decree lists various kinds of documents coming from Allied that Dixon must not use in design, construction, or operation of these proposed plants: drawings, models, blueprints, specifications, cost estimates, operating manuals, etc. It also prohibits Dixon from obtaining equipment whose fabrication is based on information from such documents.

The decree stipulates that for the next 10 years, Dixon must not allow the three individual defendants who formerly worked for Allied in technical capacities "to engage in any activity that in any way relates to hydrofluoric acid, aluminum sulfate, or the manufacture of sulfuric acid by the sludge-acid decomposition process."

'Due Process' Point: Spevack — previously an employee of AEC and later a consultant to that agency—contends that he invented the heavy-water process under a governmental contract that gave him all rights to any of his discoveries. AEC has used the process, but now feels that the technique can be divulged for commercial use. Spevack has been trying to prevent publication because that would keep him from obtaining patents in various foreign countries.

Spevack asserts (1) that the Atomic Energy Act does not authorize AEC to publish his invention; (2) if the court rules to the contrary, then the law violates the Constitution's due-process clause.

Gas Bills Going Up

Chemical process companies using Louisiana natural gas will soon be paying higher rates.

The state legislature last week passed a bill that doubles the present gas gathering tax of 1¢/1,000 cu. ft., starting Aug. 1. Moreover, the new bill wipes out the present exemption on gas going directly to consumers.

And this week, the legislature votes on a proposed constitutional amendment that would boost the gas tax still further, to 3¢/1,000 cu. ft., when the present bill expires in '60.

Producers are expected to pass the tax boost on to the pipeline companies, which in turn will raise their rates to consumers. And Louisiana gas users, including process firms, complain that increased gas rates would boost production costs to where operations might not be economical.

WIDE WORLD

Fighting the Grasshopper Plague

With grasshoppers swarming across Western wheat lands in the worst plague in 10 years, insecticide makers are working with farmers, aerial-spraying contractors and government scientists to help save ripening crops.

Aldrin, dieldrin and heptachlor are being used to fight the infestation on an estimated 11 million acres in the Great Plains area of Colorado, Nebraska, Kansas, Oklahoma and Texas. In eastern Colorado alone, a $110-million wheat crop is at stake. U.S. Dept. of Agriculture can pay up to one-third of spraying costs.

COMPANIES

Olin Mathieson Chemical Corp. has reduced the number of its operating divisions from 14 to seven. The Squibb, Winchester-Western and International units are unchanged, but the 11 other former divisions are being integrated into four new divisions: Chemicals, Metals, Packaging and Energy.

The Energy Division covers all OM activities in solid propellents, commercial explosives, high-energy fuels and nuclear fuels. Under the Chemicals Division will be industrial, organic, agricultural and phosphate chemical operations. The Metals Division takes in all metals operations, including the new aluminum fabricating business. Packaging includes kraft paper, fine paper, film and lumber.

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Du Pont has acquired a number of U.S. patents and patent applications covering certain textured yarn processes developed by American Enka Corp. Du Pont and Enka explained that this move was intended to eliminate possible patent conflicts.

Du Pont has been licensing textile processors to make bulk or textured yarn under its Taslan trademark. Enka will discontinue licensing but will continue to produce Skyloft bulked rayon yarn.

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Food Machinery and Chemical Corp. has changed the name of its Organic Chemicals Division to Chemicals & Plastics Division. The company says the change reflects the division's increasing concentration on work in resins and plastics.

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National Dynamics Corp. (New York) and its wholly owned subsidiary, Stacy Warner Corp. (Miami, Fla.), are under a new board of directors, following the sale of about 1 million in stock by President Elliott Meyer. Acquiring control of the chemical specialties company: Delaware Valley Financial Corp. (Philadelphia) and private investors Stanton and Robert Miller (also of Philadelphia). Further acquisitions are contemplated to expand National Dynamics' operations "in allied and diversified fields."

EXPANSION

Synthetic Rubber: At Institute, W.Va., Goodrich-Gulf Chemicals is expanding its crumb rubber facilities, will complete a $1-million unit by September. The company also will add an extruder-dryer in October for use in producing electrical-grade rubbers and other special polymers.

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Titanium: Despite the currently depressed market for titanium, more than 20 companies have shown interest in the government's 6,000-tons/year titanium plant in Chattanooga, Tenn., offered for sale or lease by General Services Administration. Sealed bids were scheduled to be opened June 18 in the GSA regional office in Atlanta.

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Helium: President Eisenhower has asked Congress to appropriate an additional $11.3 million for expansion of helium facilities during the fiscal year beginning next month. Proposed construction also would involve use of $1.1 million of unobligated funds. Dept. of Interior is working out arrangements with gas producers for processing to be done by U.S. Bureau of Mines.

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Beryllium: American Beryl Corp. has opened its mill at Masonville, Colo., and is processing 100 tons/day of beryl ore from the company's 1,640 acres of mining claims in northcentral Colorado.

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Hydrocarbons: El Paso Natural Gas Co. expected to start construction this week of a $5-6-million natural gas extraction plant at Opal, Wyo. This plant will have 250-million-cu.ft./day capacity, utilize gas from the Big Piney field in southwestern Wyoming. El Paso plans daily output of 122,000 gal. of propane, 83,000 gal. of butane, 62,000 gal. of natural gasoline.

FOREIGN

Methanol/Germany: Badische Anilin- & Soda-Fabrik (Ludwigshafen) plans to "considerably" increase its methanol capacity—which now amounts to more than 10,000 tons/year. The project probably will be completed before the end of this year. BASF now makes about half of West Germany's methanol.

•

Paints/West Indies: West Indies Paints, Ltd., has been organized to manufacture The Glidden Co. paint products at Kingston, Jamaica. Granted "pioneer industry" status, the new company will be exempt from income taxes for up to seven years, will also be allowed to import equipment and materials on a duty-free basis.

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Chemicals/Russia: The Soviet Union says it will reorganize the agency that runs its chemical industry. The present Ministry of Chemical Industry will become a government committee for the chemical industry. This change may be related to Premier Nikita Khrushchev's plan for $25-billion expansion of Russia's chemicals, plastics, fibers and fertilizers industries over the next seven years (*CW, June 7, p. 13*).

•

Insecticides/Mexico: A Diamond Alkali affiliate—Insecticidas Diamond del Pacifico—that already operates a plant in Ciudad Obregon has just completed additional facilities at Hermosillo, also in the state of Sonora. The project was termed by the company "part of Diamond Alkali's continuing expansion program in Mexico."

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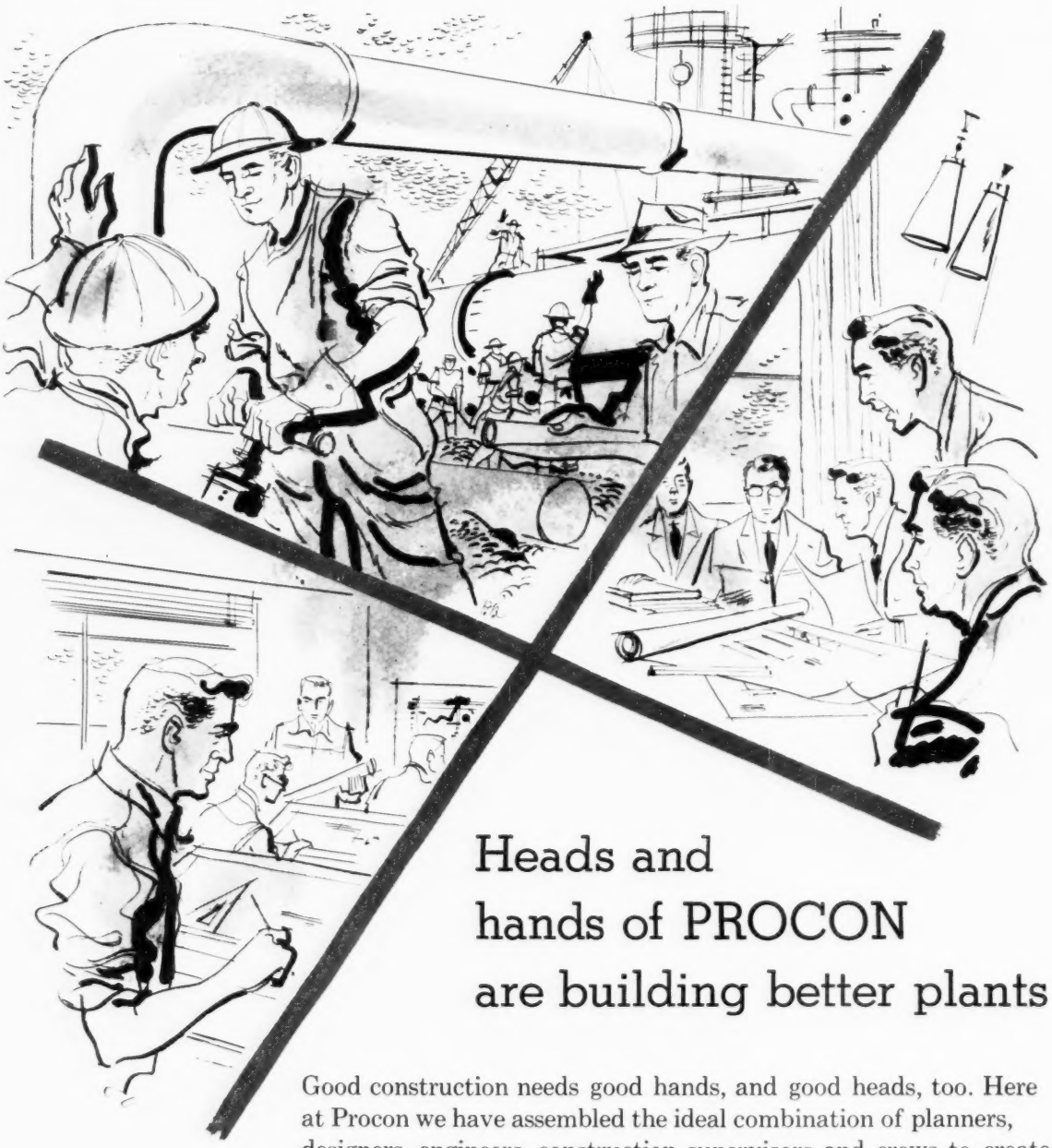

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Prefabricated units of Freeport's Grand Isle sulfur plant are readied for trip to offshore site.

Steel Island Brings in Sulfur from the Sea

Seven miles out in the Gulf of Mexico this week, Freeport Sulphur Co. is laying the "cornerstone" of the first offshore sulfur-mining plant (CW Technology Newsletter, June 14).

Unlike the usual inscribed granite block, however, this cornerstone is a six-sided framework of 55-ft.-long, 34-in. steel pipe *(see cut, p. 30)*—the template for pilings that will support the nucleus of the world's largest steel island squarely atop the vast Grand Isle sulfur deposit.

Startup of the $30-million island-building project culminates several years of planning and engineering preparation. Freeport became interested in the project shortly after the Grand Isle deposit was discovered by Humble Oil and Refining Co.'s offshore exploration crews, has had engineers working on various planning phases for the last seven or eight years. And though a few details—such as how to transport the sulfur to the company's Port Sulphur, La., plant—remain undecided, the plant is scheduled to be completed by late '59, to start producing in '60.

Anchoring an Island: To anchor the island in the 50-ft. mud bottom overlying the sulfur dome, 237-ft. steel pilings will be driven deep into the gulf floor and accurately positioned by the 34-in.-diameter vertical members of spacing templates. In all, five large towers will be erected to support the major installations; 10 smaller towers will be used to support 200-ft.-long bridges between units.

When it's all assembled, the island will form a giant "Y" with drilling platforms at the ends of two of its 1,300-ft. arms; power plant, shops and living quarters on the third arm. A third drilling platform, which will be used to sink waste-mine-water wells, will be located near but not connected to the main island.

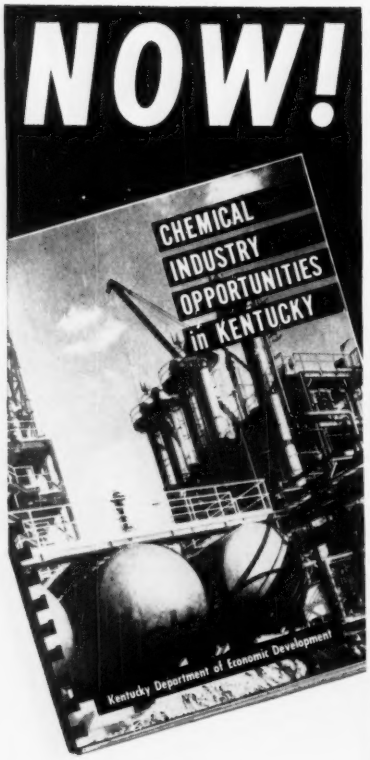
Directional Wells: Because it's not feasible to move the offshore drilling platforms, as is done on land when a sulfur well stops producing, each of the Grand Isle drilling units is designed to handle about 108 wells by directional drilling techniques. Each platform will be equipped to work a dozen wells at a time—eight producing wells, four others at various stages of drilling.

Despite this flexibility, Freeport foresees the need for more drilling platforms connected to the main island, says it may be necessary to move the drilling structures at least once before the sulfur dome is exhausted.

Another condition that may require relocation of the drilling units is subsidence of the gulf floor. Freeport estimates that the bottom, now at a depth of 50 ft., may settle as much as 43 ft. as the sulfur is withdrawn. For this reason, the power plant's supporting structure was set as far as possible from the area to be mined.

Sea-Water Process: A key feature of the offshore Frasch-mining operation is Freeport's patented sea-water treating process. The company first developed it to treat the brackish water used at its Bay Ste. Elaine mine *(CW, Oct. 18, '52, p. 68)*.

To safely dispose of the 5 million gal./day of sea water pumped into the sulfur deposit, Freeport has provided special facilities to remove all the pollutants from the waste mine water before it is returned to the gulf. As it comes from the dome, the



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Grand Isle cornerstone is 115-ton template, placed this week.

waste water will first be flashed to drive off hydrogen sulfide supersaturation, then mixed with large volumes of fresh sea water by dilution pumps. Normal oxygen content of water used in the latter step, says Freeport, is sufficient to oxidize remaining traces of hydrogen sulfide and still leave sufficient oxygen to support marine life.

The waste water will then be returned to the gulf where normal wave action will provide aeration and dispersal. Disposal provisions at the Grand Isle site have been approved by Louisiana Stream Control Commission, which has jurisdiction over offshore pollution problems.

Transportation Problems: A helicopter will shuttle the island's 250-man operating crew to and from the mainland.

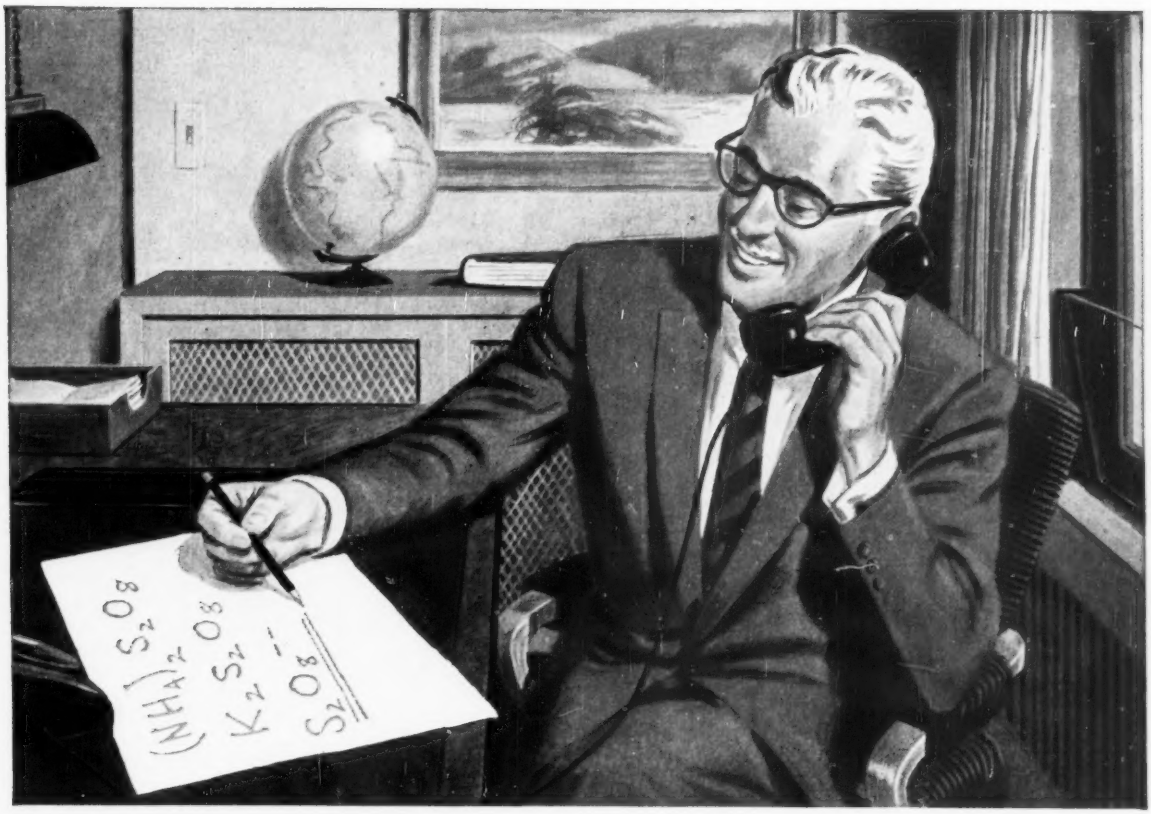
Not so simply solved, however, is the problem of transporting sulfur from Grand Isle. The company is still evaluating two alternatives: shipment by molten-sulfur barges or transfer by heated pipeline. Of the two, barging would likely be more expensive and more vulnerable to bad weather.

A seven-mile pipeline to carry molten sulfur to a shore point for transfer to barges operating in the company's regular shipping channels would avoid most of the weather interruptions. But this plan presents some tricky engineering problems of its own—such as locating, repairing leaks.

The line would consist of three concentric pipes with the molten sulfur flowing through the annular space between an inner hot-water line and an outer layer of insulation. Since the line would be buried about 4 ft. deep in the gulf bottom, it might be necessary to pull the inner pipes out on shore to make major repairs.

Hurricane Preparedness: Because Grand Isle is in the heart of the area known as Hurricane Alley, Freeport has designed its steel island as stormproof as possible. The lowest part of the 60-ft.-high platform and bridge structures is above the level of the highest waves that have been recorded during the past 100 years of gulf storms. However, the proposed pipeline would be vulnerable to hurricane-lashed waves.

As for the safety of personnel, it's currently planned to shut down the offshore operation and evacuate the crew in the event of a severe storm. After the steel island proves it can ride out a hurricane, says Freeport, evacuation may be unnecessary.



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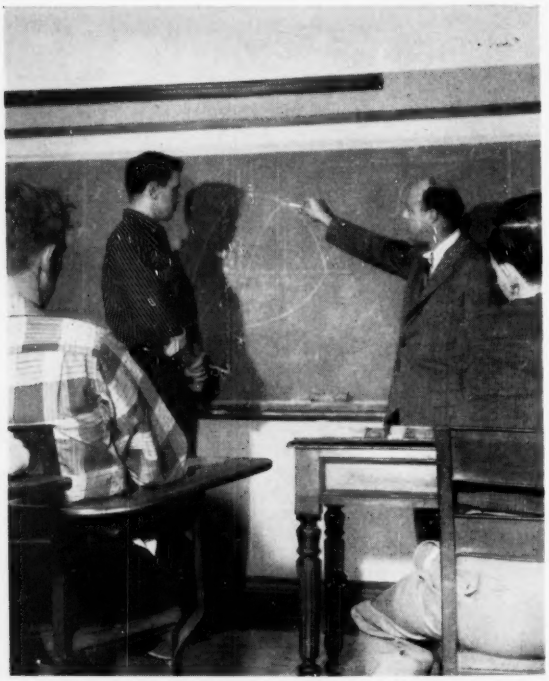
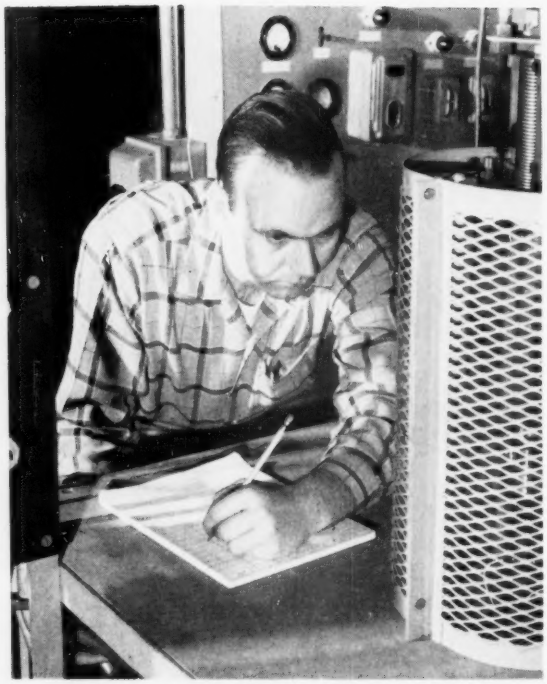


Fansteel engineering-technician trainees study technical subjects at college 10 hours/week . . .



. . . spend 30 hours/week on the job, tackling assignments of gradually increasing complexity.

Training a Technician for Engineer's Work

This week, as campus bells around the country herald graduation days and the start of summer study sessions, a pioneer group of 10 eager young employees of Fansteel Metallurgical Corp. (North Chicago, Ill.) start the final year of an unusual training program—a three-year combination course of campus and on-the-job education designed to make high-grade engineering technicians out of high school graduates.

Conducted in conjunction with nearby Lake Forest College, the course was initiated by Fansteel's John Meade, vice-president and director of industrial relations, in 1956. The company, like most others, was that year hit by a desperate shortage of engineers and scientists. With demand for degree men soaring and graduating classes dwindling in size, Fansteel couldn't find a fraction of the number of engineers and scientists that it needed. For Fansteel, at least, this was not a new situation, but the acuteness of the shortage of '56 served as the last straw, demanded a permanent solution of the manpower problem.

The resulting program was not intended to turn out full-degree scientists and engineers, but was designed to produce men with a solid and extensive background in technical fundamentals coupled with an intimate knowledge of Fansteel's specific operations. The trainees will be able to take over high-level technical assignments that demand creative thinking — assignments that have traditionally been in the province of the man with the degree. The college-graduate engineers can then devote their talents to even more complex tasks.

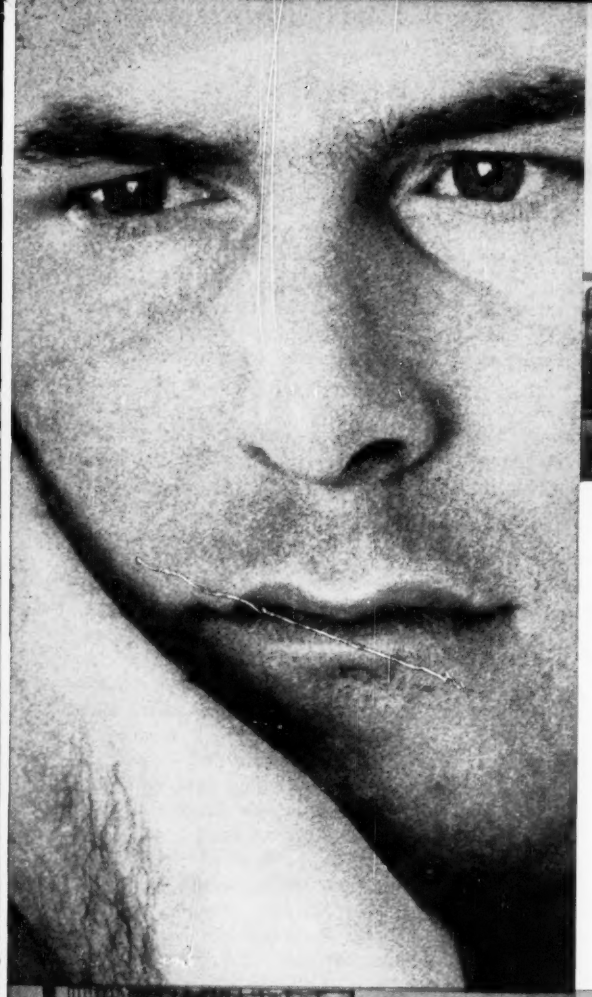
"The engineering technician fills the gap between the lab technician, who handles routine tasks, and the degree man, who turns his talents to creative and visionary thinking," says Fansteel management.

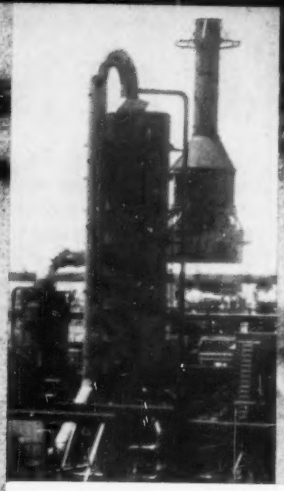
Finding the Men: To get the right kind of personnel for the engineering technician role, Fansteel set up a rigorous selection system. Of some 250 people who initially applied, only 24 were accepted. Fansteel requires that applicants have top-notch high school records, be under 25 years of age and have completed their military obligations.

When accepted, the trainee may select one of two courses in the program: a chemical-metallurgical engineering course or an electrical-mechanical engineering course. Both require a minimum of three full years of training—10 hours/week of classroom and laboratory work plus 30 hours/week on the job.

At Lake Forest, trainees acquire about 60 accredited college points by carrying about seven credit points a semester for a total of nine semesters. Their courses are identical to those taken by the regularly matriculating Lake Forest students. The chemical-metallurgical curriculum includes 6 credits of English composition, 4 of technical drawing, 8 of general physics, 18 of mathematics, 24 of chemistry.

Fansteel keeps close check on the





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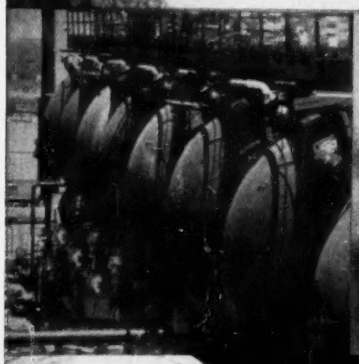

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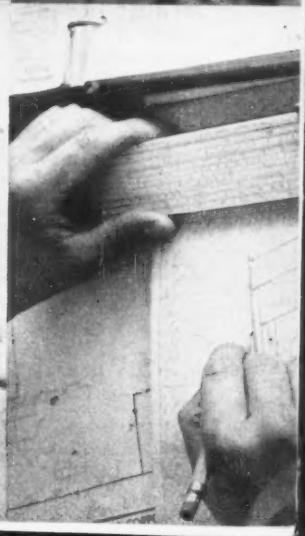

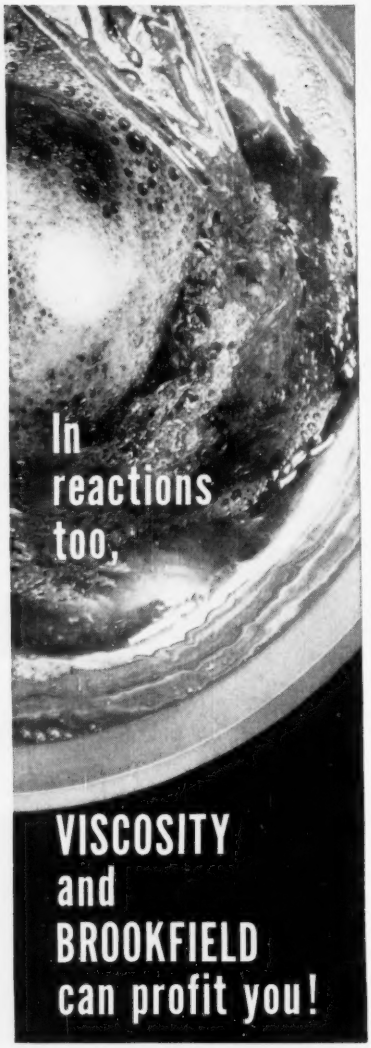

It's true. In-process viscosity measurement is the most direct progress report of many chemical reactions that you can obtain. In polymerization reactions, for example, Brookfield process-mounted Viscometran units eliminate the need for constant sampling, assure greater product uniformity and guard against run-away reactions.

Like color, pH and stability the viscosity of any material is a vital property, a fundamental measurement, which can be easily and accurately evaluated and controlled with low-investment Brookfield instrumentation.

If you would like to know more about the profitable role of viscosity control in your processes, write today for complete technical information. There is no obligation.

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ENGINEERING LABORATORIES INCORPORATED
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trainees' work at the school, demanding "something better than the minimum academic requirements of the college"—better than a "C" average. The company takes a "stern father" interest in the trainees' school work, for, like many a father, it's picking up the bill. The investment in each trainee's education is $1,400/year, estimates Fansteel.

But the program is offered with no strings attached. The trainee has no contract or obligation, other than ethical, to Fansteel. He is free to leave the firm at any time. The company, of course, feels that few will, for the program is strongly fostering the trainees' identity with Fansteel, has apprised them of their prospects of a promising future with the firm.

Some trainees are continuing their college studies on their own time, either at Lake Forest or at another local college, to obtain their degrees. Delighted, Fansteel has offered to continue paying all the educational expenses of trainees who maintain "B" averages or better, 75% of fees of those who maintain "C" averages or better.

The 30-Hour Work Week: Working a 30-hour week at Fansteel, trainees start, essentially, in the role of lab technicians. But as they progress through the training program, the scope of their work and their responsibilities gradually broaden. Since the trainees' work week is three-quarters that of the lab technicians, their starting salaries are about 25% less than the lab technicians'. But every six months, trainees are awarded raises in line with their increasing responsibilities. Though Fansteel tries to keep their salaries relatively equal, occasionally one man may exhibit special merit and forge ahead in reimbursement. Trainees also receive all employee benefits—paid vacations, group insurance, hospitalization, etc.

Workers' Choice: Trainees may select the department in the Fansteel organization in which they want to work. And the company maintains maximum flexibility, allowing them to change assignments as their interests and talents develop. The trainees are now working in the research lab, process control lab, in the central engineering department, industrial engineering and electrical engineering. In fact, one trainee is working in the sales engineering department, aiming at an eventual career as a Fansteel salesman.

The departmental assignments are aimed at promoting the trainees from the routine jobs. In central engineering, for instance, they are not only draftsmen—they are also involved in plant engineering, equipment procurement and development. In the process control lab, their major fields of interest center around quality control and process specifications. Besides running routine analyses, trainees operate a number of highly complex instruments (e.g., X-ray fluorescent spectrograph), study how to improve product quality and processing conditions and specifications, and make recommendations. Other trainees work closely with supervisors as operators and junior engineers in pilot plants—they set up tests, collect and interpret data. Some work as assistant foremen and assistant metallurgists in the plant, collecting data, running control tests, trouble-shooting.

A sample project being handled by a trainee is the tracking down of a process bug in Fansteel's tantalum operation. Selective crystallization of potassium fluorotantalate is often accompanied by a certain amount of iron contamination. The trainee's assignment is to study the process, set up a bench-scale pilot plant to test his ideas, make recommendations to the chief chemist on how to keep the iron in solution.

The Payoff: As a result of the program, Fansteel reports, "these men are developing an astonishing amount of creativity and imagination. They're handling high-level technical assignments with originality and are making significant contributions to our technology."

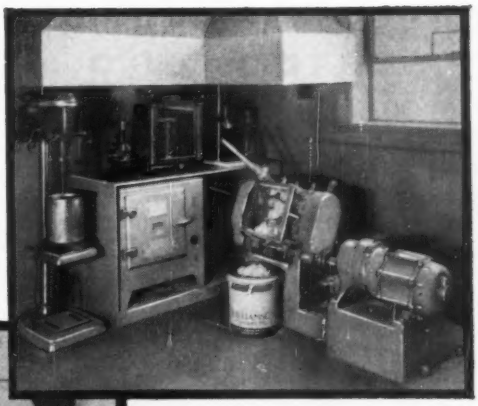
The company expected such results, but in the long run, not before the first crop of trainees had completed the course. One striking example of their contributions is an idea, originated and developed by a third-year trainee, that is now in the process of being patented. Concerned with cutting costs and production time in a metallurgical operation, the idea should result in savings of tens of thousands of dollars, estimates the company. And it's just one early return on an investment that should reap large dividends for Fansteel in the future.

BAKER PERKINS MIXERS duplicate laboratory results on a production scale at WILLIAMSON ADHESIVES, INC.

Williamson Adhesives, Inc., of Skokie, Ill., are engaged in custom compounding of a wide variety of pre-mix molding materials for sale to the compression molding industry. To insure duplication of pilot results, Williamson uses Baker Perkins Mixers in both laboratory and production operations. A small 2.25 gallon Baker Perkins batch mixer is used in the laboratory for making test runs and developing new products, while a 100 gallon B-P mixer is used for actual production. As the small unit is identical in design and function to the large mixer, Williamson chemists can follow their manufacturing processes from the pilot plant stage to full scale production and maintain the same standard of quality.

The versatile B-P 100 gallon mixer can handle 500 pound loads of widely dissimilar materials; soft doughs, plastics, heavy viscous semi-liquids or dense, fibrous masses.

With the aid of careful temperature, moisture and operational controls possible with Baker Perkins equipment, Williamson is able to increase capacity, control quality and extend the range of materials which may be processed. The benefits gained with B-P Mixers at Williamson Adhesives, Inc., are proof that BAKER PERKINS Mixers are best. If you have a mixing problem, a Baker Perkins Sales Engineer is a good man to call in.



360

See our insert in Chemical Engineering Catalog for additional information.

BAKER PERKINS INC.

CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN

What's new in processing chemicals?

News has a cash value for the chemical processor. Whether it's about new products or new applications for familiar products, this news can make the difference between keeping ahead of competition and having to catch up with it. This series of chemical news notes is designed to help you keep products, processes . . . and profits up to date.

You may wish to check certain items in this advertisement and forward to those concerned in your company.

Route to:

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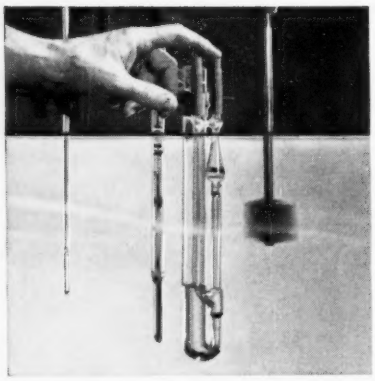
BIG STIR FOR BETTER SOLUTIONS CREATED BY 3 NEW METHOCEL PRODUCTS

Production managers are looking eagerly over the shoulders of their research chemists these days and nights as they work overtime to get the most out of three newly announced Methocel® (Dow methylcellulose) products.

These three new products expand the already unequalled Dow line of synthetic gums (industry's widest), making available viscosities ranging from 10 cps. to 15,000 cps. Together with new techniques for putting Methocel into solution, they promise to open whole new areas of profitable use for these water-soluble, non-ionic gums.



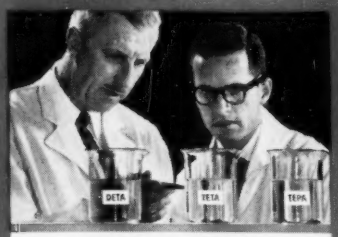
New high-viscosity Methocel being measured with pinpoint accuracy with Ubbelohde viscosimeter

Reports are coming in from textile, paper, food and paint laboratories all over the country.

Here's what they're saying about . . .

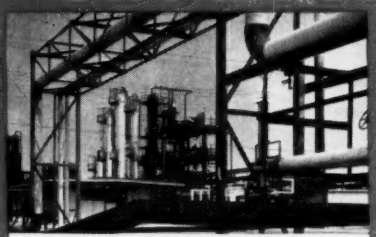
METHOCEL 60 HG — "Better organic solubility and compatibility than other water-soluble gums yet still retains its water solubility." "Great for industrial paint removers, alkyd modified latex paints and coatings that must lay down a film from an organic solvent for fast drying." "Can be plasticized and made thermoplastic to heatseal coatings." "Better emulsifier and emulsion stabilizer because it's more surface active than other water-soluble gums."

DOW CHEMICALS . . . EXCITING



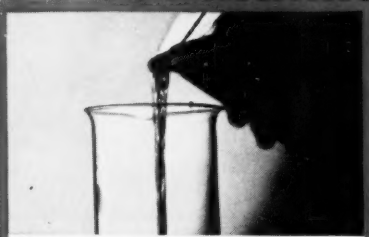
ETHYLENE AMINES

Three higher amines offer challenging potentialities as intermediates: Diethylenetriamine, triethylenetetramine, tetraethylenepentamine.



GLYCERINE

Expanded production facilities furnishing uninterrupted supply of three grades, synthetic, USP and USP 99.5%—all of unexcelled purity.



POLYPROPYLENE GLYCOLS

Polypropylene Glycol P2000 RG is but one of six resin grades that assure users exact degree of firmness or hardness in polyurethane production.

METHOCEL 70 HG — "Exceptionally good for industrial emulsions such as asphalt and other petroleum based types."

METHOCEL 90 HG — "Completely solved our problem of thermal gelation." "No gelling at temperatures below 90°C. (194°F.) . . . at last we can take advantage of the non-ionic, surface-active and film-forming properties of Methocel."

METHOCEL 90 HG, 15,000 cps—"Very low concentrations of this high viscosity product gives us efficient thickening. Should result in substantial savings."

These reports have a familiar ring to the people at Dow. That's because they read like chapter and verse from the newly published Dow handbook on Methocel. This 60-page package of facts shows the versatility of Methocel as a thickener, stabilizer, film former, emulsifier and binder. In addition to describing the new products, it also reports on established members of the Methocel family . . . MC, 65 HG, CAM, AS-2, AS-4, and AS-8. Copies are available immediately from Dow.

After 20 years . . .

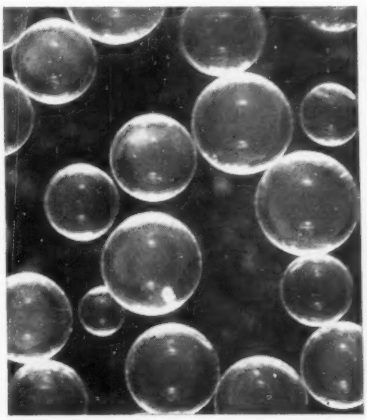
Ion exchange resins are being 'rediscovered'

In the 20 years or so since they were first discovered, ion exchange resins have softened oceans of water. These years of yeoman service have been worthwhile, but research chemists now probing the new uses for these resins find they've come across a basic, cost-saving industrial process with many really revolutionary uses.

"It's like discovering you've had an Einstein working as a file clerk," said one chemist. "We've found valuable new uses for ion exchange resins in concentration, conversion, fractionation, purification and catalysis."

Actually ion exchange might be considered the latest link in the chain of chemical processing evolution. Dow production and technical service personnel have geared themselves for the forthcoming expansion. Current users have found ion exchange practical and beneficial for such uses as uranium recovery, de-ionization of glycerine and sugar solutions, epoxidation catalysis, rare earth separations and recovery of metal finishing solutions such as chrome plating baths.

A big processing advantage in the ion exchange method, chemical processors are finding, is that ion exchange resins can be produced in an almost infinite variety to fit specific needs.



Increased bead strength and stability in new white cation resin, Dowex 50W.

These resins are manufactured by Dow under the trademark Dowex®. Dow technical service specialists are constantly helping chemical processors apply the principle of ion exchange to a multitude of manufacturing problems. Complete information on the various resins in the Dowex line and the countless specialized formulations possible is available from Dow.

This settles it:

Separan 2610 breaks flocculation bottlenecks

When it came to separating solids from liquids, a lot of chemical processors found that their biggest industrial waste was *time*. But that was before Separan® 2610.

A glimpse at the record of this high-speed flocculant shows why so many processors are impressed by its performance. A uranium ore processor reports: "With Separan 2610 we can make one thickener do the work of *five*." A copper processor says: "Increased settling rates with Separan 2610 increased our ore processing capability 1,600 tons a day, cut unit costs, and prevented bottlenecks."

The stop-watch of a West Virginia coal operator clocked Separan 2610 doing a two hour settling job in *seven minutes*. A paper mill superintendent explained that a small amount of Separan 2610 as a filler retention aid has decreased costs $10 per ton for 50 lb. offset bond while maintaining specifications.

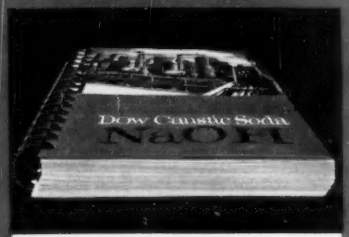
In an ever-widening variety of thickening, filtration and clarification applications, Separan 2610 is solving many problems, clarifying plant influents, providing cleaner recycle water, and increasing solids recovery. Results are continually startling new users.

As one processor put it, "We didn't even know we could improve the economics of our operation until we learned about Separan 2610. We're still amazed!"

* * *

If you aren't already profiting from these and other Dow chemicals, we suggest you write for complete information to THE DOW CHEMICAL COMPANY, *Chemicals Sales Department 7508-1, Midland, Michigan.*

POSSIBILITIES



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DOW CHEMICALS: Basic to the chemical processing industry

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YOU CAN DEPEND ON DOW

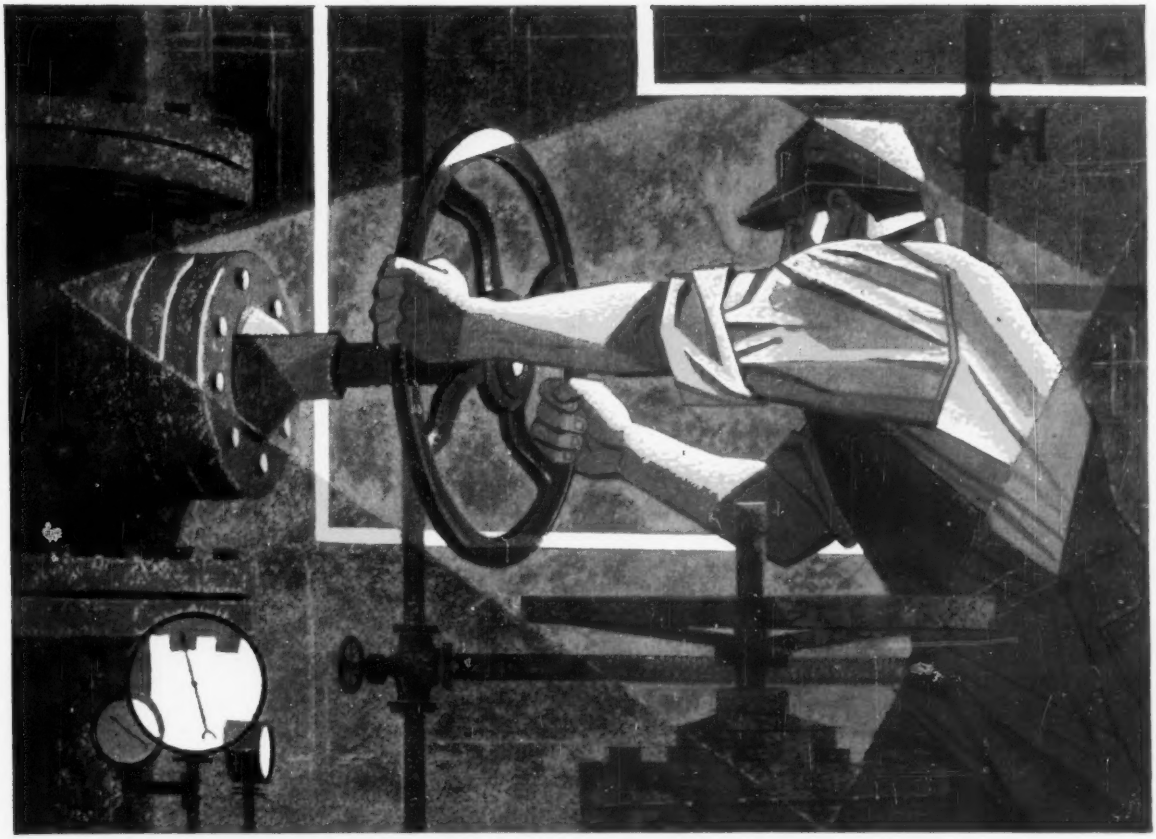
Fire Fighting Calls For New Chemicals

There's no secret about the claims for General Fire Extinguisher Corp.'s soon-to-be-launched fire-fighting compound. But there's no word about its chemical composition. It's to be a "universal" material, effective against burning liquids and electrical fires, as well as ordinary combustibles. Such a "universal" compound could do much to switch the emphasis of fire-fighting-products manufacture from equipment to special chemicals.

General's new development, although it's likely only one step toward making fire extinguishers more applicable and more salable, could bring a powerful new competitor to the chemical-"charge" field now almost exclusively the bailiwick of a few materials.

Favorite Five: Aside from water, only five basic types of extinguishing charges are used in today's fire-protection equipment: dry chemical, soda acid, foam

UPI PHOTO



Improved NEVILLE 2-50-W Hi-Flash* Solvent brings you better finishes at lower cost

Neville's 2-50-W Hi-Flash Solvent has always been characterized as a superior, fully refined, water-white naphtha with a slow evaporation rate, good odor, high flash point and excellent solvency power. *Now, through improved control techniques, the solvency strength has been increased with no change in the product's low cost.*

And beyond solvency power, 2-50-W offers a number of other advantages to the manufacturer of alkyd finishes, aluminum paints, marine finishes, varnishes and enamels. It leaves no gummy residue to soften a finish, aids adhesion, hardens uniformly, and improves brushing, flowing and leveling characteristics. It aids in promoting surface tension control when used in aluminum paints, thereby promoting better leafing and leaf retention. 2-50-W is available for quick delivery in drums, transports or tank cars. For further information or a sample, please write to Neville Chemical Company.

* *Trade Name*

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Please send information on Neville 2-50-W Hi-Flash Solvent.

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(mechanically and chemically made), carbon dioxide and vaporizing liquid.

- Dry chemical. The extinguishing agent in dry units is sodium bicarbonate; 7% of the sodium bicarbonate made in the U.S. in '57 wound up in fire extinguishers. Additives such as magnesium stearate and calcium phosphate are generally mixed in to make the chemicals free-flowing.
- Soda acid. Sulfuric acid and sodium bicarbonate are used to make carbon dioxide, which propels water from these units.
- Chemical foam. Sodium bicarbonate and aluminum sulfate make up the charge used in foam units. Protein stabilizers are usually added, too.
- Carbon dioxide in steel cylinders under pressure.
- Vaporizing liquid. These units generally contain carbon tetrachloride (trichloroethylene is added as a freeze depressant); a few contain chlorobromomethane. About 3% of all carbon tet sold goes into fire extinguishers. Methyl bromide, because of its toxic effects, is seldom used, except in aircraft fire extinguishers. Research is being done on use of fluorinated hydrocarbons, such as dibromodifluoromethane and bromotrifluoromethane, but they aren't yet market factors.
- Pressurized water. Water plus a freezing point depressant, usually calcium chloride, and a wetting agent go into these extinguishers.

Sales of portable fire extinguishers and fixed systems (including water sprinklers) built around these chemicals will reach an estimated $156 million this year at the retail level—an increase of 20% over '54. This is, of course, largely the value of equipment rather than chemicals used.

Fixed Market: The bulk of this $156-million/year business is in fixed systems. Sales of these systems—using water (as do 80%), mechanical and chemical foam, carbon dioxide or dry chemical as the extinguishing agent—will reach $120 million this year. A large part of this sum will go for the design of the units—average cost of installing a fixed system is $15,000; some units cost as much as $100,000.

Carbon dioxide systems probably score the second-greatest sales, on a unit basis, followed by foam, then dry-chemical systems. Although dry-chemical systems are in fourth position, they appear to have the greatest growth potential—for several reasons.

Dry Season: Development of dry-chemical charges has given the fire extinguisher business its greatest growth impetus in years, both for fixed systems and for portable fire extinguishers. Of the $36 million spent last year for portable units, roughly 50% went for dry-chemical systems, about 25% for carbon dioxide units, 10% for carbon tet units, 10% for soda acid units, the remaining 4% for loaded stream (water plus calcium chloride antifreeze), foam and chlorobromomethane units.

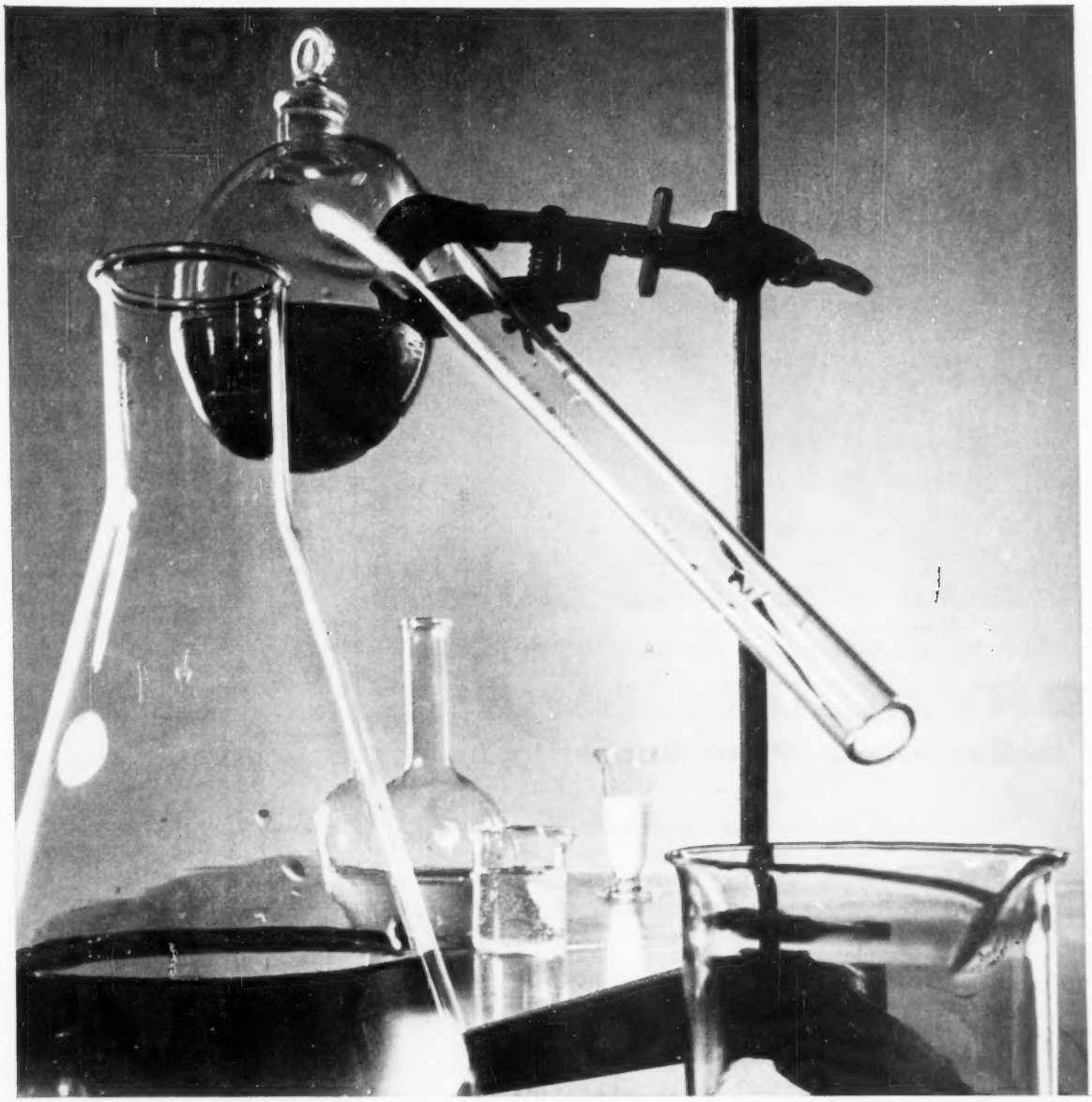
Just how fast dry-chemical units are growing in the portable extinguisher field can be gauged by the report of one industry spokesman that sales of dry-chemical units increased 750% from '47 to '54. This growth is largely attributed to the great number of extinguisher manufacturers that got into the dry-chemical field in '47. Until '47, one company, Ansul Chemical Co. (Marinette, Wis.), kept the dry field to itself, with patents. But when these patents ran out in '47, other extinguisher makers hurried into this lucrative market. Sales of dry-chemical units have continued to rise — they're now up 50% over '54's.

Change in Charging: While dry-chemical units are climbing, sales of extinguishers charged with carbon tet, foam or soda acid are tumbling. Sales of carbon-tet extinguishers have fallen off 25% from '54; foam is down about 20% from its '48 sales volume. Just how rapidly soda acid extinguishers are losing sales is hard to estimate, but most industry spokesmen agree they're definitely sinking. On the other hand, carbon dioxide units have pretty much held their own. Their sales volume is about the same as it was four years ago.

Of all the fire-fighting chemicals marketed, carbon tet appears to have the gloomiest future. Reason: the toxicity problem. The chemical's fumes are hazardous. Also, when it is played on a fire, carbon monoxide and hydrogen chloride, as well as traces of phosgene (a highly toxic gas) are given off.

Legislatures in at least 10 states have, or will soon introduce, bills outlawing or drastically limiting the use of carbon tet extinguishers.

The New York City Transit Authority did a lot to trigger this action last January when it made plans to



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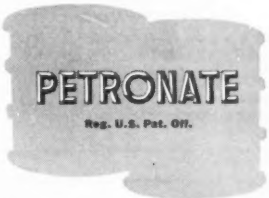

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SPECIALTIES

remove 6,000 carbon tet extinguishers (value, $87,000) from New York subway cars. The extinguishers, now being discarded at a rate of 1,000/year, are being replaced with dry-chemical units.

More Water: Soda acid extinguishers are being replaced by compressed air- or carbon dioxide-operated water units. Obvious reasons for this: water is easier to clean up than bicarbonate and sulfuric acid; and the extinguishing agent is cheaper. There's this, too: the amount of flow can be easily regulated with a valve, unlike the soda acid units, where the extinguisher's entire charge is used up in one shot.

Anti-Fire Chiefs: There are about 16 major manufacturers of portable fire extinguishers. Ansul Chemical, Walter Kidde and Co. (Belleville, N.J.), American LaFrance-Foamite Corp. (Elmira, N.Y.), Fyr-Fyter Co. (Dayton, O.), General Fire Extinguisher Corp. (Philadelphia) are probably the biggest.

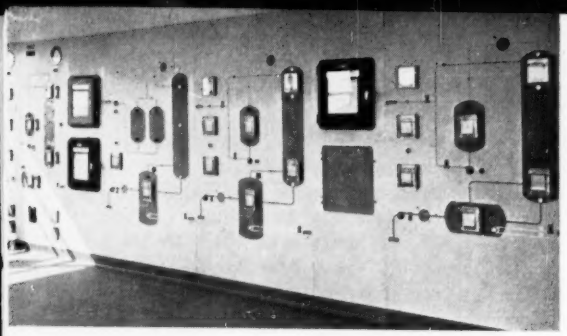
In the dry-chemical field, Ansul is strongly on top. Fyr-Fyter and its divisions are probably largest in soda acid and carbon tet. In carbon dioxide extinguishers, Walter Kidde and Co. leads the field.

In the fixed-systems field, Grinnell Co., Inc. (Providence, R.I.) is biggest —especially in the water-sprinkler field. Grinnell's biggest competitors are Rockwood Sprinkler Co. (Worcester, Mass.), National Foam System, Inc. (West Chester, Pa.), and "Automatic" Sprinkler Corp. of America (Youngstown, O.).

Chemical Makers Market: The chemical process industries are their own best customers for fire-extinguishing compounds and equipment. Makers of petrochemicals, textiles, paints and plastics are the prime buyers. Other large volume users of fire-fighters are the transportation, primary and fabricated metal, utility and aircraft industries.

During peacetime, the military is not more than 5% of the total market. Hotels, although not a large primary market, spend a substantial amount for replacement charges.

Selling Protection: Most sales of fire-fighter systems are made through jobbers and distributors — only a small percentage through manufacturers' salesmen. The ratio of distributors and jobbers to salesmen is



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Capryl Alcohol
Carbon Tetrachloride
Chlorbenzene
Chloroform
Dibutyl Phenol
Dibutyl Phthalate
Dicapryl Phthalate
o-Dichlorbenzene
Diethanolamine
Diethylene Glycol
Dimethyl Phthalate
Dimethyl Sebacate
Dipropylene Glycol
Dodecyl Alcohol
Dodecylbenzene
Ethyl Acetate
Ethylene Dichloride
Ethylene Glycol
Ethyl Hexanediol
Ethyl Lactate
Glycerine
Glycol Ethers
Hexyl Alcohol
Isobutyl Alcohol
Isodecyl Alcohol
Isooctyl Alcohol
Isophorone
Isopropyl Acetate
Isopropyl Alcohol
Methyl Alcohol
Methyl Amyl Alcohol
Methylene Chloride
Methyl Ethyl Ketone
Methyl Hexyl Ketone
Methyl Isobutyl Ketone
Monoethanolamine
Naphthas
Nitrotoluols
Nonyl Phenol
Octyl Acetate
Perchlorethylene
n-Propyl Alcohol
Propylene Glycol
Pyridine
Toluene
Trichlorbenzene
Trichlorethylene
Tricresyl Phosphate
Triethyl Amine
Triethylene Glycol
Trimethyl Borate
Vinyl Acetate
Xylene

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TRULAND

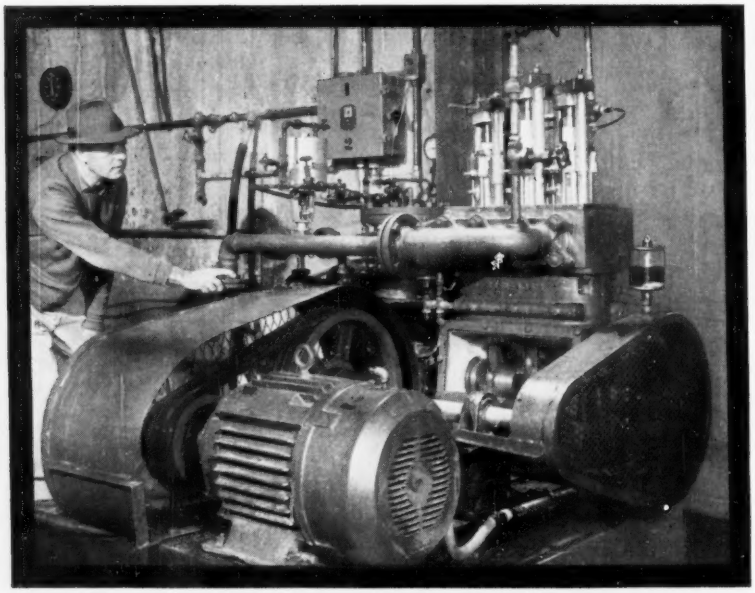
TRULAND CHEMICAL COMPANY
EAST RUTHERFORD, NEW JERSEY

A DIVISION OF THE TRUBEK LABORATORIES

JACQUES WOLF & CO. SOLVES PROBLEM:

How to maintain constant, undeviating pressure in the production of highly corrosive chemicals...

Precise, non-fluctuating pressures must be maintained in continuous processes at the Carlstadt plant of Jacques Wolf & Company. Erratic pressure caused by drop in volumetric efficiency could ruin an entire batch of costly material.



How Jacques Wolf solved the puzzle: Looking for an answer to the problem, Jacques Wolf called on Aldrich engineers to design a pump which provided the proper corrosion resistance, fluid velocity and wear characteristics to insure dependable, continuous operation.

Result: The Aldrich Triplex Pump shown above has met all guarantees. Working 24 hour days, 6 day weeks, it has maintained the precise, non-fluctuating pressures demanded by the application. It efficiently handles both alkaline and acidic materials.

We'll be glad to send you full information on Aldrich Pumps and their advantages to you. Simply write Aldrich Pump Company, 3 Gordon Street, Allentown, Pa.

the toughest pumping problems go to ALDRICH

about 9:1. Major sales are made through the approximately 1,500 specialty distributors who handle only fire apparatus. In addition to these specialty distributors, there are about 4,000 jobbers who handle fire-protection equipment as well as automotive supplies.

Wholesale markup on portable extinguishers varies widely, from 10 to 25%. There's not much uniformity in selling extinguishers, either. However, most distributors won't sell unless they can get at least 10-15% off the list and quantity prices of portable extinguishers. Price of portable extinguishers varies from $16 to $800 each.

Untapped Market: For years, fire-extinguisher manufacturers have been trying to crack the consumer market —all attempts have met with a notable lack of success. The big problem in selling homeowners has been in overcoming reluctance of people to invest in an item they can't "watch, wear, listen to or cook in." The average person never suffers a fire, and an extinguisher hanging on a wall doesn't seem important.

Nevertheless, there's a terrific potential in the home market—less than one-half percent of U.S. homes have fire extinguishers. Aerosol-packaged units account for the largest volume sold to home owners. In '57, 2.4 million aerosol fire-fighters were filled, but how many of these were actually sold is not known. Sales volume of aerosol-packed extinguishers have been decreasing about 5% each year since '53, their peak year.

The consumer market is likely to remain just a potential until makers of fire extinguishers offer a low-priced, effective model. Aerosol units provide limited protection, and other conventional, portable extinguishers are still too costly.

There's little doubt of the real need for more effective, complete, fire-protection units. Last year, more property was burned up in major fires than ever before in history. Devastation by fires of all sizes in the U.S. and Canada hit an unprecedented total of $1.3 billion last year. Industrial plants suffered the sharpest increase in fire loss — up $25 million from '56's record-breaking $70-million loss. A universal, low-cost chemical unit could do much to reduce this loss—a giant chemical opportunity.

Washington
Newsletter

CHEMICAL WEEK
June 21, 1958

Minerals and trade policy will get a real going over in the Senate this month and next. Debate on the House-approved reciprocal trade extension bill and Interior Secy. Fred Seaton's proposals for stepped-up federal aid to domestic metal-mineral producers will be tied together; the outcome of each depends on the other.

Seaton has reduced pressure by the mining states for metal tariff and quota boosts by juggling his minerals stabilization proposals to include a stockpile of 150,000 tons of copper to be accumulated over one year at 27½¢/lb. Total cost: $82.5 million. Lead-zinc producers hope to push through a similar purchase plan.

The trade fight will run longer and hotter than it did in the House. In the Senate, higher-tariff advocates will center their arguments around amendments aimed at raising tariffs and quotas on specific commodities—oil, textiles, minerals and chemicals. They'll seek to cut the proposed extension from five years to three.

•

Imports of chemicals, among other commodities, may be cut back as a result of amendments to the 1921 antidumping law. Technical changes, having passed both houses of Congress, now await Senate-House compromise. The revisions would make it easier for domestic producers to claim, and show, that foreign competing products are being sold in the U.S. at below "fair value."

•

Tax relief for small-businessmen has an excellent chance of passage before Congress goes home—and this in turn keeps alive the hopes of those who want Congress to approve some broader tax legislation. Advocates of excise tax relief particularly hope to hitch a ride on the small-business tax bill—despite the powerful bipartisan opposition in both houses that has controlled tax matters so far.

The small-business tax package doesn't provide any benefits as far as income taxes are concerned but does have some widely favored provisions that would:

- Allow, for the first time, tax amortization deductions on used machinery and equipment.
- Allow small corporations—those with no more than 10 stockholders—to be taxed as partnerships.
- Grant a 10-year payment period for estate taxes if the estate is made up mainly of investments in a closely held enterprise. (These tax payments are now due 15 months after death.)
- Hike the $1,000 limit that original investors may deduct as a capital loss.

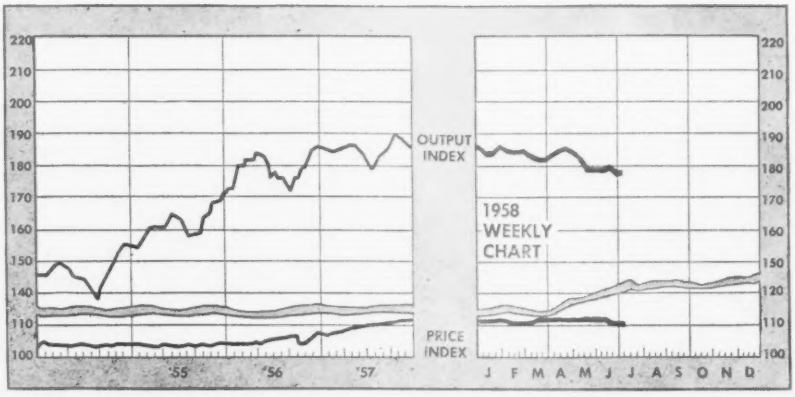
Washington Newsletter

(Continued)

Higher minimum wages for workers in chemical companies selling to federal agencies may be in the offing. Labor Dept. has scheduled a public hearing June 24 to get employer and union views on possible redefinition of the chemicals and related-products industries and on wage data to be sought by the Bureau of Labor Statistics in preparing for a proposed revision of existing Walsh-Healey pay rates. Floors for government contractors—set in 1949— now range from $1 to $1.40/hour. The BLS survey will measure increases in prevailing minimums paid by the industries since that time; this data will serve as the basis of a subsequent hearing to determine new floors.

Among preliminary issues to be settled is whether to hold to the present definition, which subdivides the industries into three groups for Walsh-Healey purposes: (1) refined and industrial basic chemicals, whose present floor is $1 in the South and $1.15 elsewhere; (2) cleansers, polishes, insecticides and fungicides, with a flat $1 minimum; (3) bone, carbon and lamp black, now pegged at $1.40.

Labor Secy. Mitchell is weighing industry and labor protests to proposed revisions in the Walsh-Healey minimum wages paid by paint, varnish, drugs and medicine producers. AFL-CIO President George Meany charges that the proposed hikes—to $1.50 in the hourly rate paid by paint and varnish makers and to $1.20 for drug and medicine producers—are based on outdated wage surveys and should be higher to reflect recent wage boosts. National, particularly Southern, industry spokesmen counter that $1.50 is too high for smaller plants and out of line with Southern rates.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	178.0	177.0	183.0
Chemical Week wholesale price index (1947=100)	110.7	110.8	110.0
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	39.46	39.61	45.82

MONTHLY Employment (thousands)	Latest Month	Preceding Month	Year Ago
All manufacturing	15,046	15,113	16,762
Nondurable goods	6,562	6,585	6,867
Chemicals and allied products	796.9	810.0	837.8

Don't pay today's prices for yesterday's engines!

Read on following pages how the new Worthington SLHC engine compressor can substantially reduce your gas handling costs

Only SLHC Turbocharged Gas- Worthington offers all these

MODERN DESIGN

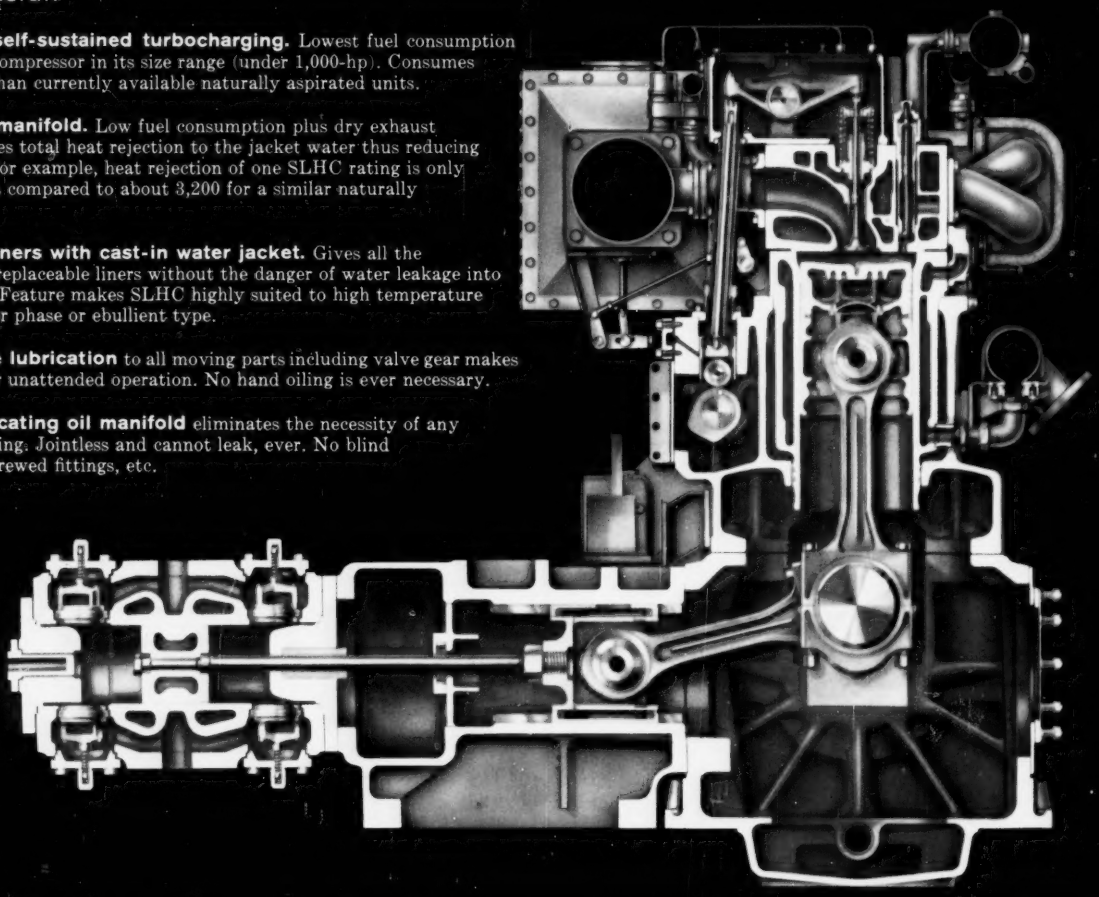
Completely self-sustained turbocharging. Lowest fuel consumption of any engine compressor in its size range (under 1,000-hp). Consumes 20% less fuel than currently available naturally aspirated units.

Dry exhaust manifold. Low fuel consumption plus dry exhaust manifold reduces total heat rejection to the jacket water thus reducing radiator size. For example, heat rejection of one SLHC rating is only 2,015 BTU's as compared to about 3,200 for a similar naturally aspirated unit.

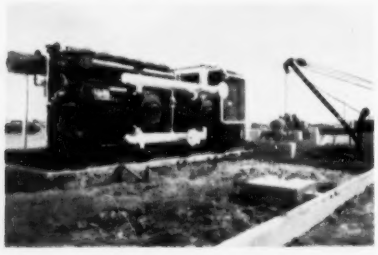
Removable liners with cast-in water jacket. Gives all the advantages of replaceable liners without the danger of water leakage into the crankcase. Feature makes SLHC highly suited to high temperature cooling of vapor phase or ebullient type.

Full pressure lubrication to all moving parts including valve gear makes SLHC ideal for unattended operation. No hand oiling is ever necessary.

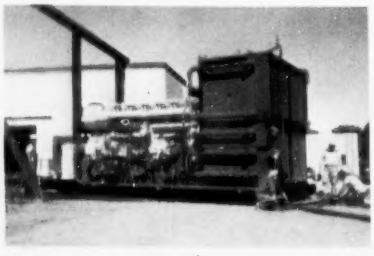
Cast-in lubricating oil manifold eliminates the necessity of any internal plumbing. Jointless and cannot leak, ever. No blind connections, screwed fittings, etc.



Six-cylinder SLHC unit installed by Northern Natural Gas Co. in the Oklahoma Panhandle.



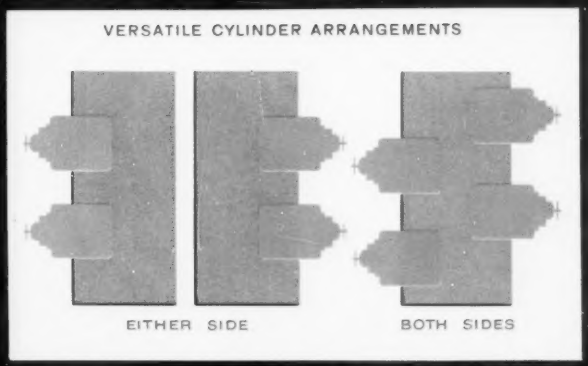
One of three 6-cylinder skid-packaged SLHC units being prepared for shipment to Bolivia, S. A.



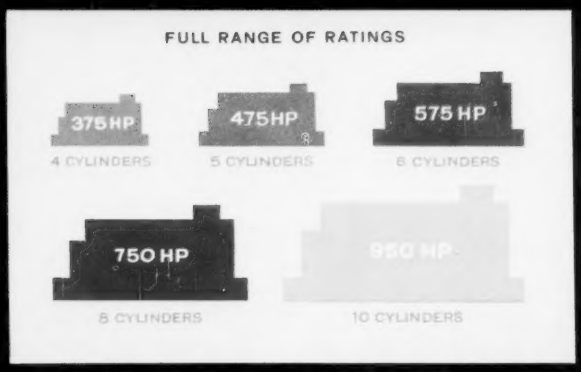
Six-cylinder skid-packaged SLHC unit for service in a Louisiana gas field.

Engine Compressor by modern, dollar-saving features

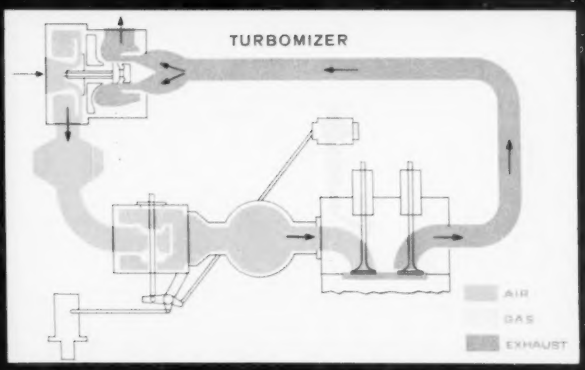
The SLHC will give you about 20% better fuel economy than currently available naturally aspirated units. This chart shows the savings per year for each 1000 hp of continuous operation on natural gas.



Piping and construction problems can be greatly simplified thanks to versatility of cylinder arrangements on SLHC. Cylinders can be mounted on either or both sides. If mounted on both sides, SLHC permits twice as many cylinders as most engine compressors in its size range.

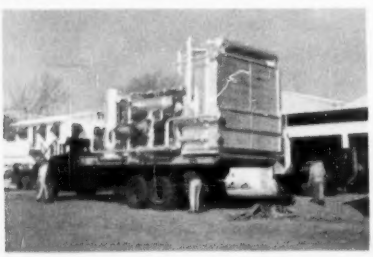


These are the range of ratings offered in the SLHC. Note that all units operate at the conservative speed of 450 rpm with a conservative bmep of under 135 psi. All units may be skid "packaged" —including the 950 hp rating, the largest available for this type service.

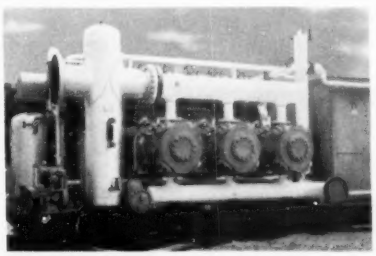


Worthington's Turbomizer is the simplest fuel control system on the market. It offers remarkably favorable fuel consumption and stable operation over the complete load and speed range. Allows operator to compensate for different fuels and heating values in one adjustment.

One of two 4-cylinder SLHC engine compressors to be installed by Permian Basin Pipeline Co. in Lea County, N. M.

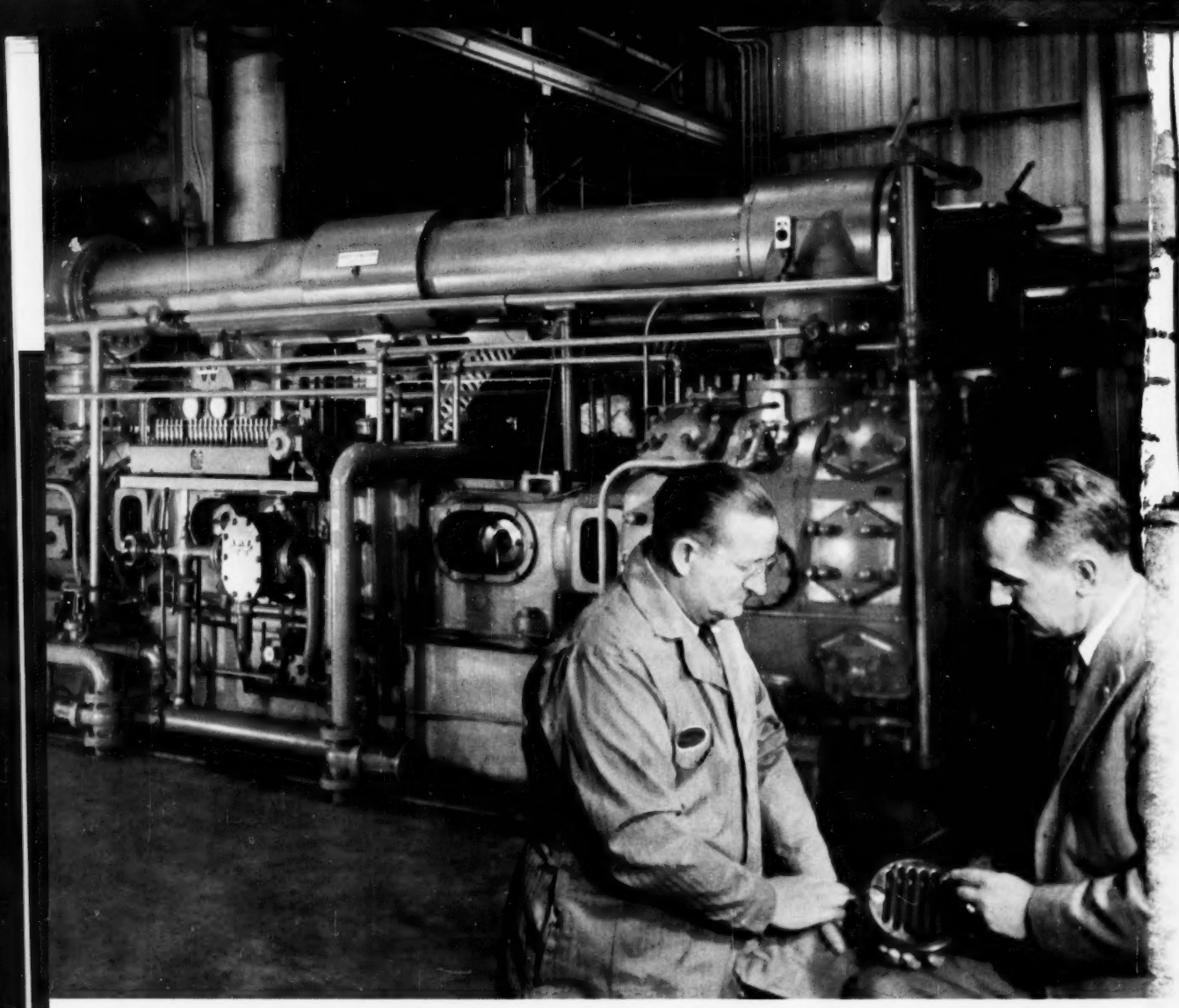


Six-cylinder skid-packaged SLHC gas-engine compressor for a Texas natural gasoline pant.



For complete details, get in touch with your nearest Worthington district office. Or write to Worthington Corporation, Section 43-1, Harrison, N. J. In Canada: Worthington Canada Ltd., Brantford, Ont.

WORTHINGTON

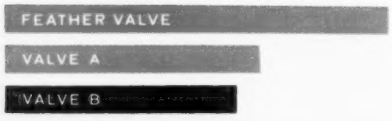


User-survey shows – in all operating categories

FEATHER VALVE VOTED BEST

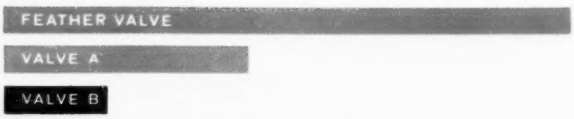
Simplest Construction:

Lowest Maintenance:



Most Efficient:

Quietest:



A recent survey among compressor users showed this marked preference in all four operating categories for the amazing Feather* Valve. The Worthington Feather Valve is the lightest, fastest-acting compressor valve available. Because of its lightness and flexibility it provides very sharp action with virtually no slip or back-flow. And because it works with no impact . . . has no buffer plates or cushioning devices . . . it is all but indestructible, assures long-life with negligible maintenance costs.

To get the most in performance when you buy your next compressor, specify Worthington with the rugged Feather Valve feature. Worthington Corporation, Harrison, N. J.

*REG. U.S. PAT. OFF.

WORTHINGTON

1958

1959

1960

THE NEXT 5 YEARS

The chemical process industries aren't shrugging off the '58 recession, but neither are they buried in gloom. Reason: anticipated boosts in industrial sales, population, new product research and expansions point unerringly to a new boom. Ahead: the Golden '60s.

1963

Special Report

In five years, the U.S. economy—paced by the fast-stepping confederation of chemical process industries—will take off on another roaring boom. By 1962 or '63, all the measures of prosperity will be recording the upbeat.

- Gross national product, the basic business benchmark, will top $515 billion/year—up at least 20% above the current rate.
- Industrial output, reflected by the Federal Reserve Board index, will climb 25-30 points higher than the 135 anticipated for this year.
- Total business capital expenditures will reach close to $45 billion, compared with '58's expected $31-billion outlay. (Last year, it was a record $37 billion.)

And sales, profits, investments will accelerate concomitantly.

These conclusions stem from knuckle-hard projections by some of the country's leading economists, industrial executives and government statisticians.

And supplementing their findings are the results of an intensive *CW* survey of a representative cross-section of the sprawling near-$76-billion CPI.

Underlying these predictions are solid, growth-nurturing factors. Population is one. Increasing average income per family is another. And add industry's continuing emphasis on research and development, which yearly produces a raft of new products.

Market and Labor Source: Take population, for instance. It's estimated that there are 173 million people in the U.S. today and that population will grow to 177 million by '60, to more than 185 million by '63. A recent McGraw-Hill Dept. of Economics estimate puts the figure at 235 million by the mid-'70s.

That's where the market—and the labor force—required for the predicted high levels of business activity will come from.

Total consumer spending, including that for housing, will increase from $295 billion in '57 to about $340 billion in '63. And a big chunk of that will go, directly and indirectly, for CPI products.

Expenditures for industrial research and development (excluding that by government, universities and foundations) have been on a steep upswing since the end of the Korean hostilities. Last year, for example, U.S. industry spent some $7.3 billion on research, nearly double the $3.7-billion expenditure in '53. And, five years hence, the total R&D annual spending rate may well hit a whopping $15 billion.

Eye on the CPI: That's the panoramic U.S. economy outlook. Consider now the near-term future for chemicals and allied products, for rubber, plastics, pulp and paper, petroleum refining—the gamut of the CPI.

Tables elsewhere in this special report plot the CPI's 10-year (1953-63) climb toward greater heights. But of still more significance is the likely five-year advance now under way.

Total R&D expenditures by the CPI are slightly less than $1.04 billion/year; that rate will increase to about $1.36 billion in '63.

More than 90% of the companies surveyed by McGraw-Hill economists expect their current R&D expenditures will begin paying off in five years or less.

Capital expenditures, the money CPI will pour into new plants, modernization and expansions, will amount to well over $4.6 billion in '63. Compare that with this year's estimated $3.5 billion, and with the shade over $3 billion spent just five years ago.

CPI output (in dollars) is currently about $75.5 billion/year. Add a whopping $12 billion, say the economists, and you get a good estimate of '63 level of business—some $87.5 billion.

Probable growth is even more impressive when measured with production and capacity barometers. Using Dec. '50 as the 100 base, production, for instance, would show a 40-point jump (to 166 in '63) above this year's 126; that's about a 65% increase over '53's year-end 101. The capacity index would move up more than 75% over the same 10-year period.

Not all segments of the CPI, of course, expect to match these gains over the next five years, but the foregoing data indicates at least some growth for all chemical process firms.

Chemical companies, however, will pace the pack in just about every category of growth: production, expansion, research, sales—and profit. By '63, annual net profit accruing to producers of chemical and allied products will total nearly $3 billion—more than triple the less-than-a-billion earned five years ago.

War Push: Martin Gainsbrugh, chief economist of the National Industrial Conference Board, draws an interesting parallel between the significant 10-year periods following World War II. "The war," he says, "created a series of artificial stimuli that pushed the economy into high gear. These included: curtailment of civilian production, sharp reduction of private debt, and a bulge in private savings and liquid assets. Result was the great industrial expansion of the first postwar decade that reflected the rapid rebuilding of business and consumer stocks, and the improvement of living standards through heavy borrowing and the use of accumulated cash.

"By '55, however, many of these war-induced growth factors had begun to spend their force. Consumer outlays for durable goods and homes, for example, reached a peak."

The economic climate of the second postwar decade is fundamentally different from that of the first, Gainsbrugh notes. "The capacity shortages that existed then have now been replaced by substantial margins of unused capacity. Consumers are well-stocked with such long-lived goods as homes, automobiles and appliances." This, he avers, is the basis of the current recession. "Sales today are the result of demand creation and replacement rather than of restocking. Competition in world markets has intensified since war-devastated countries have recovered production and efficiency."

This situation, Gainsbrugh says, has been labeled "the problem of the 'middle years'—the period between the flush, first postwar decade and the golden harvest of the middle '60s. It's expected that by that time, as has been indicated, the population wave will have provided a sharp new stimulus for many major industries, including home building and automobiles.

"In the interim, however, industry faces the challenge of these 'middle years.' Competition grows tougher, and survival is no longer assured for the submarginal or high-cost producer."

The alert enterpriser, he cautions, will sense this challenge early enough to meet it through improved technology, heightened productivity and product adaptation, "and thereby earn his right to share in the promise of the '60s."

But how solid are our foundations for the future? How will the country's chemical industries meet these many challenges? To find out, *CW* went to the "decision makers"—top executives in some 30 chemical and allied products firms across the nation—to hear what their companies are planning now for the five-year period ending in '63.

Some of the answers were candid, some were cautious. Only three executives declined comment on where their companies might be five years from now; explained one: ". . . present business conditions have thrown our five-year plan into such a state of flux that we feel it would be of little or no use to you."

The recession, of course, is depressing immediate and near-term chemical trade expectations; but, surprisingly, the tenor of responses clearly shows that few firms are worried about the long-range future. Consensus: while adjustments are being made now (in inventory policies, capital spending plans, advertising and other budgetary items), within a few years even "ambitious" preslump plans will probably have to be revised upward.

With Bold Strokes: The future, of course, can't be portrayed in minute detail. But the broad picture projected by individual chemical processing firms in their answers to *CW* queries emphasizes confidence. The "ifs" and "qualifications" can't be casually put aside, however.

Air Reduction Vice-President Jack Gunther, for example, lists "certain assumptions" on which estimates of his or, for that matter, any other firm's growth pattern must be based. "The

Chemical Process Industries

	1953	1958	1963
Production (Dec. '50=100)*	101	126	166
Capacity (Dec. '50=100)*	124	165	200
Capital expenditures (million $)	3,019	3,529	4,625
Research and development (million $)	627	1,038	1,360
Output (billion $)	57.5	75.5	87.5

Chemicals and Allied Products

	1953	1958	1963
Production (Dec. '50=100)*	107	138	190
Capacity (Dec. '50=100)*	134	188	246
Capital expenditures (million $)	1,428	1,569	1,900
Research and development (million $)	361	596	750
Sales (billion $)	18.4	23.2	32.5
After-tax profits (billion $)	.9	1.6	2.9

Petroleum Refining

	1953	1958	1963
Production (Dec. '50=100)*	112	125	144
Capacity (Dec. '50=100)*	117	139	152
Capital expenditures (million $)	675	768	925
Research and development (million $)	146	245	325

Paper and Pulp

	1953	1958	1963
Production (Dec. '50=100)*	94	118	153
Capacity (Dec. '50=100)*	119	157	178
Capital expenditures (million $)	409	527	900
Research and development (million $)	28	51	75

Source: Federal Reserve Board; U.S. Dept. of Commerce; National Science Foundation; McGraw-Hill Economics Dept.; CW.
*Production and capacity indexes as of year-end.

most important," he says, "is that the present state of international tension will not change significantly over the next five years—neither total war nor total peace."

Another factor that Gunther takes into consideration in describing the probable future of his company: no sudden external influences will exert any "radical change in the trend of our major product lines."

Last year, under the guidance of President John Hill, Air Reduction racked up some new records. Sales were reported at a shade less than $190 million, 12% above the previous high of more than $169.8 million attained in '56. Net earnings (after taxes) hit approximately $16.5 million, a 5% increase over the $15.7-million peak reached in '56.

Says Gunther: Air Reduction bases its outlook on the prospects of continued growth of the economy, expects that by '63 its sales will have surpassed $300 million. That expected increase of nearly 60% over last year's sales volume is figured only on anticipated growth of the company's present products and markets, does not take into account expansions into new areas.

Continues Gunther, who is in charge of all chemical activities for Air Reduction: "We have under careful consideration plans for a number of new ventures in the chemical field. Some of these are in the early stages of planning, others are further along." He adds, confidently, "If these plans are carried through and fully developed, our estimated $300 million in sales by '63 will, without doubt, be significantly exceeded."

In the past five years, the company spent nearly $87 million on its capital expenditures program. If growth expectations are fulfilled, that figure will likely be topped by a wide margin by '63.

Recessions seem to have little effect on Air Reduction's research and development plans. "We firmly believe," says Gunther, "that this type of expenditure should not be subject to the fluctuations of the business cycle, but should be appraised in the light of long-term movements."

Larger companies, too, while naturally showing some concern, are generally inclined to regard the current state of business as a "temporary condition," only a dip in the longer-range growth curve of the chemical process industries.

Plans Unaffected: Dow, the country's fourth-largest general chemical company, with estimated total sales of $650 million for the fiscal year (ending May 31), offers this categoric answer: Dow's long-range plans aren't being altered to any great extent by the country's current business downturn.

Dow's expenditures for expansion, historically, have run on a five- to six-year cycle. Its "additions to property," for instance, peaked in '47 (at $84 million, from the previous year's $18 million); hit another peak in '52 ($145 million) after some low marks in intervening years; will reach a new top this year—about $190 million."

In fiscal '59 and '60, company officials say, such spending will probably drop off considerably. From then on, they believe, expansion activity will be influenced a great deal by what transpires.

But the outlook isn't bad at all. Some 53% of Dow's total sales are industrial chemicals, about 32% plastics, 9% magnesium (Dow is the largest private domestic producer) and about 6% agricultural chemicals. Here are some Dow "guesstimates" on how total industry demand for these lines might be expected to grow over the next five years: general chemicals, up about 30%; magnesium and plastics, up 50%; agricultural chemicals, a possible doubling of the present demand.

And Dow, like most other firms surveyed, is pushing ahead with ex-

1958
1959
1960
1961
1962
1963

pansion and development programs to help assure production capacity to meet these greater requirements. Now in all major polyethylene markets with nine new formulations, for instance, Dow is planning to add to its polyethylene production facilities. The company's low-toxicity solvent, Chlorothene, is due for a third capacity boost early next year.

At about the same time, a new continuous-process plant for Versene chelating agents is scheduled to begin operating in Texas. This plant, says Dow, should "materially reduce product costs and open up markets previously unavailable because of economic considerations." Among other promising new Dow products: thorium-containing magnesium alloys; systemic insecticides; Styron film, a "completely new packaging film."

How will Dow fare in the brightening economy? For the last 40 years or so, its sales (in terms of constant dollars) have doubled, on the average, about every five years. If the 1958-63 period comes anywhere near conforming to the average, sales volume five years hence will be climbing rapidly toward the $1.5-billion/year mark. And, adds a company spokesman, "an intervening boom could even edge that up."

Carl Gerstacker, vice-president, treasurer and a director of Dow, scanning his company's short-term outlook, says he expects business will pick up gradually this fall. He sees Dow sales hitting a billion dollars a year by '61. Much of this, he says, will come from "new products"—film, fibers, foams, latexes. But there's a qualification—that the current recession does not become prolonged.

Keeping Pace with the Economy: Du Pont, historically, has matched its rate of business growth with growth of the nation's economy. Thus, Du Pont's assessment of the future may well further substantiate predictions of greater prosperity ahead. Said President Crawford Greenewalt at this year's annual stockholders' meeting: "We have nothing but optimism for our long-term future."

Then, despite a depressing first-quarter report* that showed a sales drop of 17% below the comparable '57 period, Greenewalt strongly implied that the months ahead would bring a heartening pickup. "Sales," he said, "may not be more than 5% below those of '57." For '57, Du Pont reported sales of $1,964.6 million, near-record earnings of $396.6 million (vs. $383.4 million in '56).

*An experience shared by most chemical firms (*CW*, *May 3, p. 23*).

Du Pont avoids specifically forecasting levels it might reach in the next half decade; but if research, development and construction programs are indications, the growth will be impressive. Few Wall Streeters, for instance, predict anything less than a 35-40% increase by '63 in sales of Du Pont products. That would put the total well above $2.5 billion worth.

Chances are that the company's principal lines will change little (though there will be additions) from those it sells today—synthetic fibers (nylon, rayon, Orlon, Dacron), films (including cellophane, Mylar polyester), other plastics, paints and pigments, etc. But there will be expansion in practically every area. Du Pont's construction expenditures this year—a firm foundation for future production and sales—are expected to top, by 10%, the '57 total of $220 million, reports Greenewalt. Du Pont also plans a "modest" increase in research expenditures this year over the $80 million spent last year.

Slumps in demand from textile and automotive outlets have been chiefly responsible for the dip in Du Pont business over the last few months. But in keeping with past performances, the firm is moving ahead with synthetic fiber expansions to prepare for resurgence of demand.

A few weeks ago, Du Pont surprised the industry with an announcement that it would build a multimillion-dollar Dacron plant at Old Hickory, Tenn. The new installation (the firm's second for producing Dacron) will be designed for "ultimate production of 56 million lbs./year of staple and filament products. Scheduled startup: mid-'59.

Du Pont's fourth nylon plant, at Richmond, Va., was completed this year; capacity: some 40 million lbs./year. Behind the decision to build the latest nylon unit was confidence that nylon markets—tire cord and other industrial products—"will continue to expand."

And a new 40-million-lbs./year plant at Waynesboro, Va., for production of Orlon acrylic textile fiber will get under way later this year.

Just a couple of months ago, Du Pont disclosed incursions into two other fields. At its Washington Works (Parkersburg, W.Va.), it will build a plant to produce Teflon 100-X, a new extrudable and moldable fluorocarbon resin. And at Deepwater, N.J., a new plant is just about ready to turn out Viton, a new type of synthetic rubber aimed at solving problems of extreme heat and corrosion in jet aircraft and missiles.

Du Pont's cellophane expansions underscore its confidence that the "market for cellophane will continue to grow substantially during the next five years." In the past year and a half or so, Du Pont has blueprinted projects for adding 30-million-lbs. annual capacity at existing plants, and for a new installation at Tecumseh, Kan. (Part of the expansion has been completed, reports Du Pont, while the rest is progressing as planned. The new 50-million-lbs./year Tecumseh plant is scheduled to start operations in the fall of '58.)

Du Pont, of course, keeps close tabs on trends in industries important to its own growth. And that lends weight to its prediction that "the plastics industry can look forward to a 50% increase in total resin sales in the next five years." That would put volume of resin sales somewhere above 6 billion lbs., about 2 billion lbs. above '57 sales.

The company estimates that total polyolefin volume will be close to 1.3 billion lbs. at that time, of which some 25% will be new rigid types—e.g., linear polyethylene and isotactic polypropylene. Major volume increases are also foreseen for vinyl chloride resins, modified styrenes, and laminating resins for reinforced structures.

Only "nominal growth" is forecast for some thermosets and cellulosics, but established premium plastics (fluorocarbons, nylons, epoxies, silicones, polyurethane foams) will continue to show "substantial sales growth, percentage-wise."

Sights No Letdown: The postwar

Consensus: for the U.S. economy, the best years are ahead

Wyandotte's Semple: "By '63, rising demand will call for more capacity."

Carbide's Dial: ". . . faith in the growth of the country's economy."

Du Pont's Greenewalt: "Nothing but optimism for our long-term future."

Air Reduction's Gunther: More R&D spending for "long-term movements."

Dow's Gerstacker: "The long-term outlook still is bright . . ."

NICB's Gainsbrugh: "Ahead, the golden harvest of the middle '60s."

growth of the U.S. chemical industry has been greater than that of any major industry, and it should continue to pace the over-all economy in the coming years, say American Cyanamid economists. Chemicals production, they feel, will soon stir from the present lull, increase some 41% over the next five years.

Excess capacity for certain products may exist from time to time, but Cyanamid doesn't expect oversupply to become an extensive industry-wide problem. Says a company spokesman: The rapidity with which new uses are found, coupled with continued expansion of research and development, should balance any overcapacity. The long-term industry sales outlook more than justifies high plant outlays.

Last year, Cyanamid sales totaled about $532 million. The firm invested more than $84.4 million in plant expansion and improvement in '57, will spend $50-75 million more this year. These expansions, plus no letup in R&D expenditures (amounting to 4-5% of annual sales), may well push Cyanamid's sales close to $700 million/year by '63. That tops, by nearly 33%, the record set by the 51-year-old company in '57.

Over the years, Cyanamid has diversified—through development of new products and by acquisitions—into pharmaceuticals, plastics and resins, pigments, and organic, industrial and agricultural chemicals. The very nature of the market Cyanamid serves has been—and will continue to be—the key to company growth.

A rundown of a few of the more significant new Cyanamid projects scheduled for operation within a year or so shows the firm's confidence.

• Acrylonitrile capacity at the Fortier plant near New Orleans, La.,

is being doubled to 100 million lbs./-year, for production startup later this year.

• A 27-million-lbs./year plant near Pensacola, Fla., to produce the new Creslan acrylic fiber is expected to start partial production early in '59.

• At Savannah, Ga., capacity of Cyanamid's Unitane titanium dioxide pigments plant is being doubled to 72,-000 tons/year; completion is slated for fall of '58.

• Construction has started at the "first urea plant to be built in Canada" (Hamilton Bay, Ont.). Annual capacity will be 66,000 tons/year for captive use and for sale in solid form and as nitrogen solutions. Scheduled completion: early next year.

And just recently the company disclosed that it will build a new maleic anhydride plant, and a "multimillion-dollar" anthraquinone plant. The latter will also turn out methyl anthraquinone, naphthoquinone and phthalic anhydride. Both installations should be operating late in '59 or early '60.

Over the next five years, Cyanamid expects a 50% rise in U.S. production of industrial chemicals: it sees a continued high demand for pharmaceutical products, with sizable increases in capacity and probable lower price trends for all but new drugs, and envisions a "rising trend in demand" for farm chemicals, with greater growth in the production of high-nutrient fertilizers at the expense of less-enriched types.

Informal Concept: Not all companies have worked out "formal" five-year plans—precisely plotting future sales, earnings, expansion expenditures, and the like. Some, such as Wyandotte Chemicals, have what President Robert Semple calls a five-year "concept" for the company.

In Wyandotte's case, this comprises three parts: (1) to complete capital projects for which money (some $37 million) has already been appropriated; (2) to continue making new capital additions for rehabilitation or improvement of present plants (estimated expenditures are about $2.5 million/year); (3) to continue "active research and development" of new products from research. (Wyandotte's R&D spending currently is about 3% of sales, which last year were above $85 million.)

For years, Wyandotte concentrated its efforts on basic chlor-alkali products; but more recently, diversification has been a company keynote. The firm is moving into a wider variety of organic and inorganic chemical manufacture.

Completed last year, for instance, was a new oxide-products plant for expanding production of polyols and related items made from ethylene and propylene oxide. Due in soon are new facilities to produce propylene oxide and propylene glycol, and a new plant for production of diatomaceous-earth floor-cleaning materials is being built at Lompoc, Calif.

Wyandotte's most ambitious expansion is taking place on a 1,200-acre site at Geismar, La. Newly completed and ready for operation at that location is a big ethylene oxide-glycol unit. Work is also "moving along" on a plant to turn out 300 tons of chlorine and 330 tons of caustic soda daily. The first half of the latter installation should be in production about the end of '58; the rest, a year later.

The company, for the first time, is incurring debt (a five-year-term bank loan of $12 million) to finance such additional capacity, which—says Semple—"will be sufficient to carry into the '60s on basic products."

Wyandotte market researchers envision that total demand by '63 for the major products Wyandotte produces (and will produce) will exceed all U.S. present and known planned capacities. The researchers' conclusion—and it underscores planning in the CPI—boils down to this: within a few years, there will arise an inevitable need for additional expansions to fill increasing chemical consumer requirements. Chlorine and caustic, believes Semple, will be in this category.

Sure-Fire Bet: ". . . present conditions represent a short-term readjustment that does not affect, to any important extent, the long-range growth of industry in this country or the long-range growth of Union Carbide." That, in effect, is UCC President Morse Dial's rebuttal to predictions that the current business downturn presages a depression.

And Union Carbide—the country's second-largest chemical manufacturer—is heavily backing its optimism by going ahead with planned expansion of its production facilities. It will spend about $150 million on new construction this year (about $40 million less than in '57), expects to maintain an average expenditure rate of approximately $150 million/year for at least the next five years.

(Total sales at that time, company economists predict, will be in excess of $2 billion, compared with last year's all-time high of $1.395 billion.)

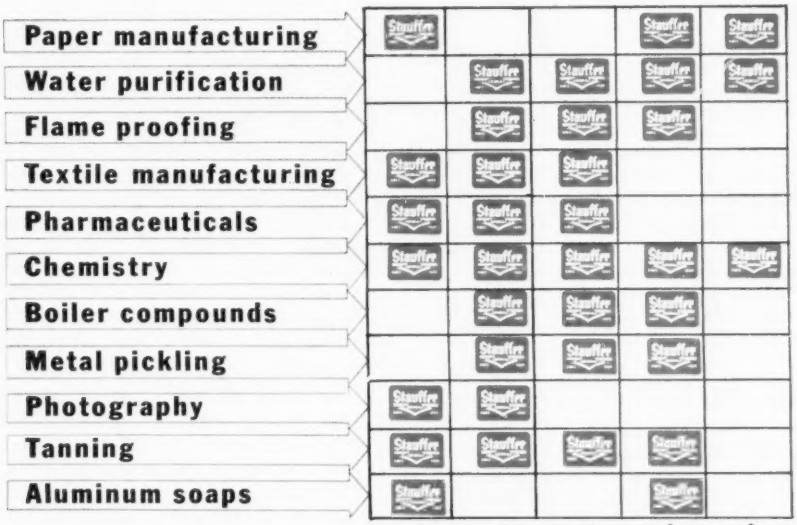
Philosophy behind the decision to push vigorously ahead with expansion programs blossoms directly from the very nature of Carbide's business. The advantages, said Dial recently, that accrue to Union Carbide as a supplier of basic raw materials to fast-growing segments of industry, also impose certain obligations. "If we are to participate in their growth and expansion," he added, "we must equip to take care of their needs."

About 29% of UCC's total sales are chemicals; about 25% alloys and metals; some 20% plastics; 14% industrial gases and carbide; and 12% electrodes, carbons and batteries. Significantly, 50-60% of this year's expansion expenditures will be for chemicals and plastics facilities. And the emphasis will continue to be on these "growth areas."

Plans are under way, for instance, for a large new chemicals plant in Putnam County, W.Va. It will be the corporation's eighth major chemicals unit and is scheduled for completion in '60. Ethylene oxide, ethanol and isopropanol will be produced there, sent to the firm's South Charleston and Institute (both W.Va.) plants for further processing.

Other Union Carbide chemicals and plastics installations planned, under way or nearing completion include: a fluorocarbon products plant and a capacity-doubling acrylonitrile plant, both at Institute; a 15-million-lbs./year plant at Marietta, O., to produce liquid epoxy resins. High-density polyethylene production was started recently at Institute; now, similar facilities are being constructed at Seadrift, Tex. A new high-pressure (low-density) polyethylene plant is also under construction at Whiting, Ind.; its rated capacity (72 million lbs./year) will raise the corporation's total polyethylene capacity to more than 375 million lbs./year, bring to eight the number of UCC polyethylene-producing and compounding locations.

MAJOR SOURCE OF ALUMS



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Special Report

These items bear out Morse Dial's statement earlier this year when the corporation announced no retrenchment in its expansion programs. This decision, he said, was based on the "strong position of the corporation's products in fast-growing areas of the chemical industry and a faith in the growth of our industry and of the nation's economy as a whole."

Reports from companies of all sizes reflect a tone of optimism for the future. Stauffer Chemical, which limits its forecasting and projecting to a two-year period, is budgeted for a capital expenditure of $14 million, practically the same as '57's; for '59, a slightly larger program. Stauffer's "over-all forecast" is based on the assumption that an "upturn in the business cycle will have occurred" by the end of the year.

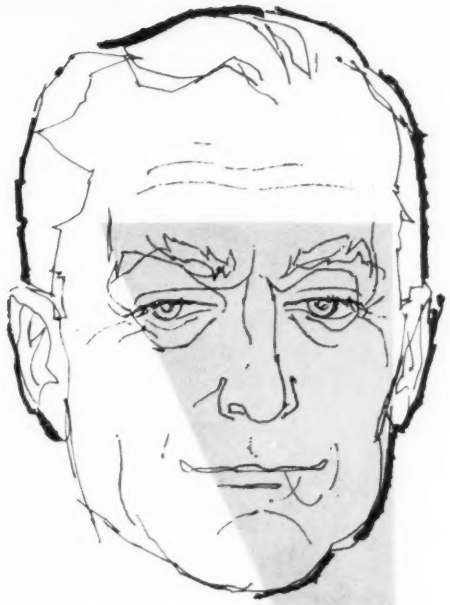
J. M. Gerstley, president of United States Borax & Chemical, tells *CW* that his company "has just completed (its) biggest expansion, which already anticipates growth." Gerstley is reluctant to discuss further expansion planned over the next five years, since these are likely to be "tied in with subjects that are strictly classified."

But, he says: "We assume, omitting the high-energy-fuel program, that the growth trend in the future should be no less than it has been in the past."

From Atlas Powder, which racked up sales last year totaling about $70 million: " . . . Atlas's sales by '63 should show a 25% increase (to about $87 million) over those in '57."

Windup for the Future: From these and many other such reports, some concrete conclusions can be derived. The drastic contraction in business activity—which most economists now agree began last summer—will soon run its course. Then will come an acceleration in production, sparked by increasing demand. "Furloughed" workers will be recalled. Inventories will be replenished (this will signal the real upturn). Industry will have rounded another turn in its race toward new highs in sales, earnings and profits.

But the expected pickup in the remaining months of '58 will be only a prelude to a longer-range prosperity. Another boom is on the horizon; and the economy—led by revitalized chemical process industries—is already girding for the bustling half-decade ahead.



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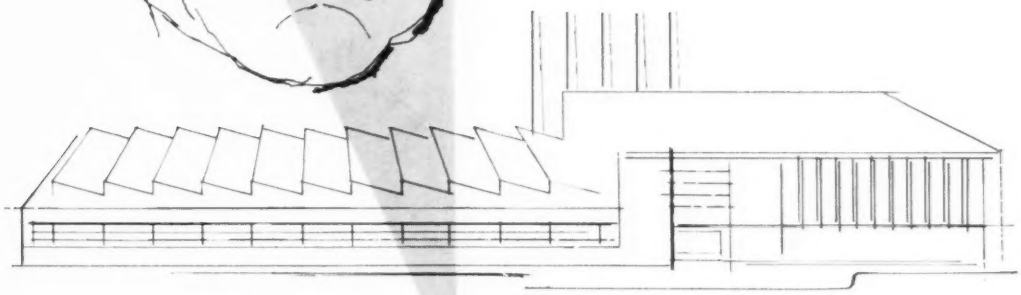

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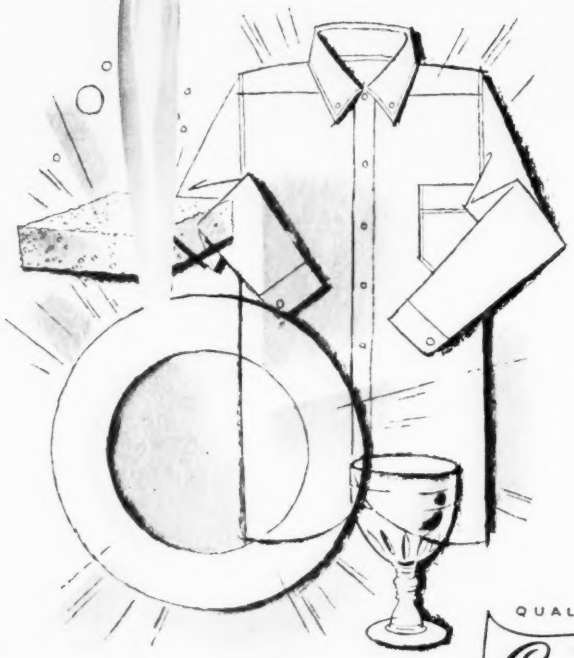

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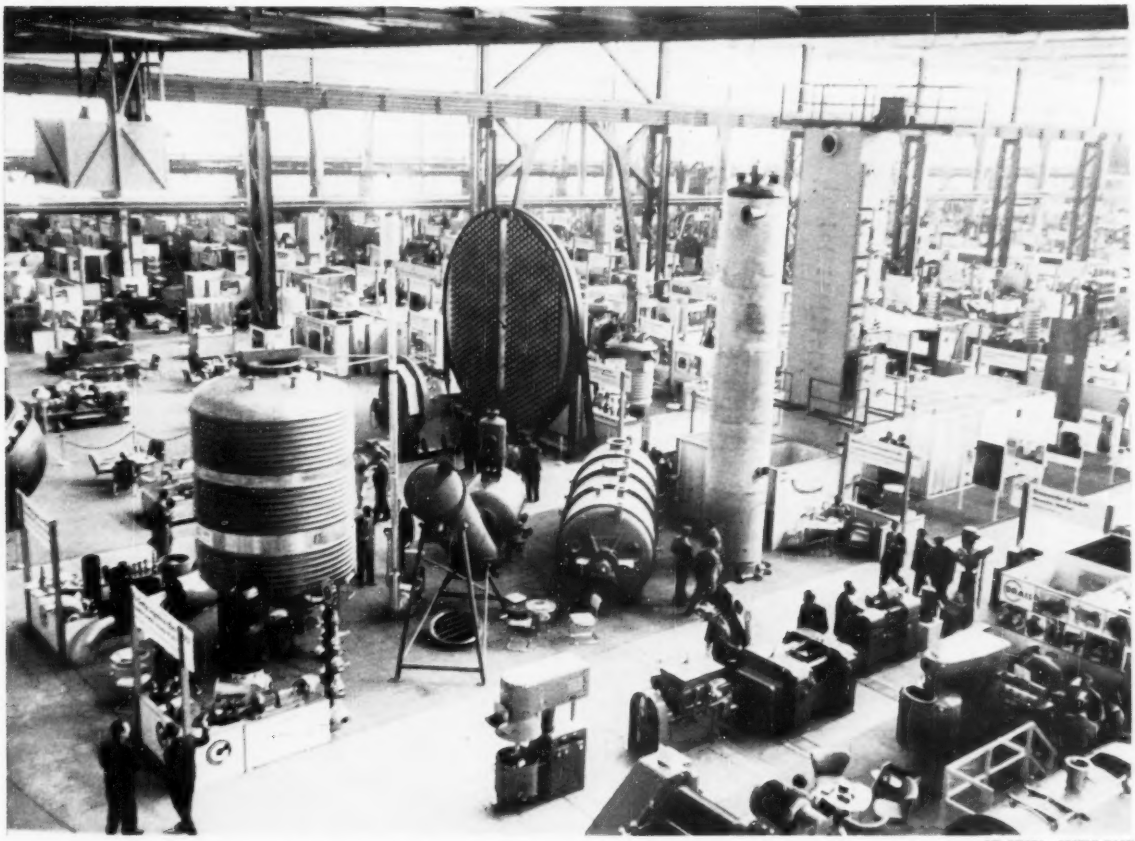

CW PHOTO—ROBERT VACK

Heavy process equipment fills one of the 14 halls at Achema, Europe's biggest Chemshow.

At Achema—a Continental Chemshow

American visitors to the just-ended Achema*—Europe's nine-day version of the Chemshow—were returning home last week, still talking about the well-displayed new equipment, and the value of the show to U.S. firms.

About 150 U.S. citizens attended the exposition, which is held every three years in the West German city of Frankfurt. This show, the 12th, was by far the largest, with some 1,000 exhibitors representing 15 countries. The nine exhibition sections, including nuclear science and technology, measurement, control and automation techniques and works techniques, were housed in 14 halls — and even Americans, generally not impressed by an exhibit's size, were this time struck by the diversity and variety of interests in the show.

For example, Jakob Eichhorn (pictures), technical assistant to the president of Dow Chemical, was disappointed with the slim American participation, felt that much could be learned at Achema for use in this country. B. J. Quinn, general production manager of Chas. Pfizer, noted the Europeans' extensive use of plastics as substitutes for heavier, more expensive alloy construction of equipment. He added that depend-

Dow's Eichhorn (sport jacket) talks equipment with Krupp.

Illuminated Zimmer exhibit draws Eichhorn's close inspection.

*Ausstellungs-Tagung für chemisches Apparatewesen.

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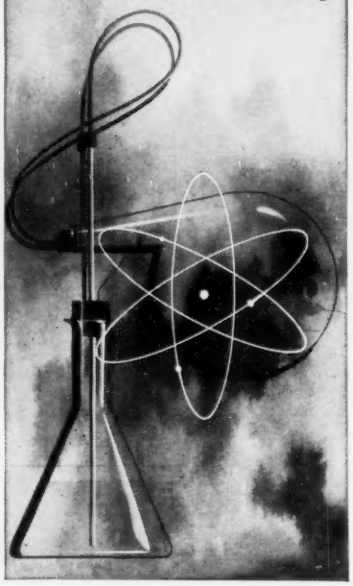

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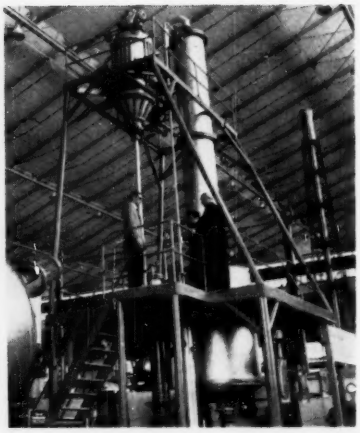
Bubble trays are discussed with Bignier, Schmid-Laurent exhibitors.



Krupp distillation column gets topside inspection after high climb.

ence on coal has led German designers to produce some excellent bulk-material handling equipment.

Du Pont's Josef Pikl told *CW* he found nothing radically new in the exhibits, but was impressed with the quality of the glass equipment on view. Ralph Landau, vice-president of Scientific Design, noticed the improvement in equipment design since the last Achema. Although there is not the diversity of design typical of U.S. equipment — no great use of such things as graphite or glass linings is made in Western Europe—he feels that some of it could well compete with U.S. designs. And prices are lower.

First Showings: Many firms used the show for first display of new equipment. Lurgi-Gesellschaft (Frankfurt, Germany) exhibited a Zdansky-Lonza electrolytic cell for production of hydrogen and oxygen at 425 psig. pressure. The cell requires 4.3 kwh. to produce 35 cu. ft. of 99.9% hydrogen and 17.5 cu. ft. of 99.5% oxygen.

Siemens-Planiawerke AG. (Meitingen, Germany) featured a resistance-heating element made of molybdenum disilicide that can be used to produce temperatures up to 3090 F.

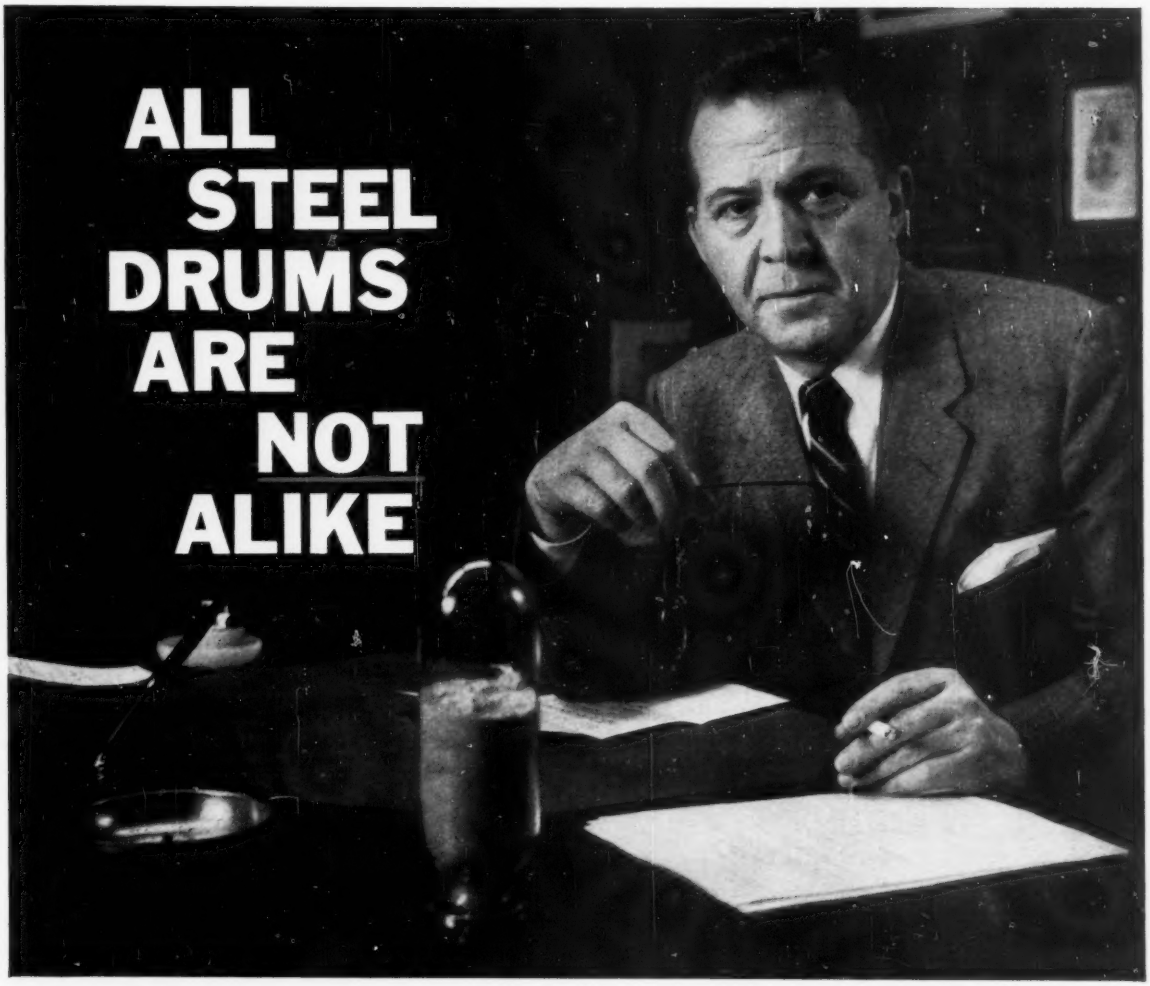
Hilger & Watts (London) featured a fluorite polychrometer for continuous, automatic analysis of carbon, phosphorus and sulfur in steel. And, for reducing time of testing of rubber compounds, Agfa AG. (Munich) unveiled its new Vulkameter. It automatically determines and records the modulus of shear during a given period of vulcanizing time.

A new rotation viscometer that gives accurate results in one minute with a 0.1-cc. sample was displayed by Gebrueder Haake (Berlin).

Americans Too: Most of the 21 American firms exhibiting at Achema were interested in exploring possibilities of selling equipment in Europe's Common Market, or were using the show to exhibit jointly with their European subsidiaries. Charles Schwarzler of Foxboro Instruments sees the show as ideal for giving representatives a taste of international activities— but he agreed it is a costly way to do so.

With the exception of a large group of government-sponsored East Ger-

Chance to rest at AEG booth wins Eichhorn's approval at day's end.



Quality rust-inhibiting coatings plus two extra purchasing advantages make U. S. Steel today's best source for all your steel shipping containers

Dollar for dollar your products are protected better by U. S. Steel rust-inhibited drums. U. S. Steel chemically cleans these drums *after* they are made, then coats them with extra zinc phosphate to give maximum protection. But . . .

At the same time you are getting this maximum protection, you can capitalize on two purchasing advantages, which you get with all U. S. Steel drums and pails:

1. Full, complete line. U. S. Steel offers the widest selection of steel shipping containers on the market. From 2½-gallon pails through 57-gallon drums–plus a complete line of stainless steel containers. This allows you to fill all your needs at one time, in one place, with absolute confidence.

2. Punctual deliveries. Seven convenient plants assure you of a smooth, even flow of containers. Your normal needs are filled without stops and starts, *and* you get quicker delivery on rush orders.

Maximum protection, simplified purchasing, punctual deliveries: you get all these extras at no extra cost. Why not talk over your needs with the man from U. S. Steel?

Factories in: Los Angeles, Calif. • Alameda, Calif. • Port Arthur, Texas • Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N.J.

PROOF OF U. S. STEEL PROTECTION!
Both these 55-gallon drums were weathered for 12 months. Rust appeared on the ordinary drum the first week. U. S. Steel rust-inhibited drum—coated with zinc phosphate—shows no trace of rust whatever.

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Whether your product or process calls for a water-soluble cosmetic ingredient or a sulfur-free cylinder lubricant for hydrocarbon gas compressors, UCON fluids and lubricants do the job.

UCON fluids and lubricants also give top performance in many other applications because of these outstanding properties:

- high viscosity indexes
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UCON fluids and lubricants are available in both water-soluble and water-insoluble series with wide viscosity ranges.

Find out how these outstanding properties can improve your product or process. Write for F-6500.

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"Ucon" is a registered trade-mark of UCC.

Du Pont's Pikl (center) examines model of Lurgi refining plant.

man manufacturers and one Hungarian autoclave maker, Soviet-bloc countries were more poorly represented at the show than the U.S. Most of the East German equipment was of design and price comparable with that from West Germany. Drawing most attention were a new range of standardized fractionation units for easy expansion or reduction of plant size, made by Heckmannwerk, and a Krygostat, for maintaining temperatures of —290 F, economically.

Judging from the strong Russian delegation that toured the exhibits, however, it was evident that Russia

Foxboro was one of 21 American firms exhibiting at giant show.

Dr. Erle Ayres answers some pertinent questions on

THE AMINE-BORANES

"interest centers around their catalytic, stabilizing and antioxidant properties and their selective reducing action in non-aqueous solvents"

Dr. Erle Ayres, Ph.D., Duke University
Marketing Division, Callery Chemical Company

Q. Dr. Ayres, what are the Amine-Boranes?

A. They are complexes of borane (BH_3) with amines. Most secondary and tertiary amines form stable complexes.

Q. What Amine-Boranes are offered?

A. Dimethylamine-Borane, $(CH_3)_2NH{:}BH_3$, Trimethylamine-Borane, $(CH_3)_3N{:}BH_3$, (white solids) and Pyridine-Borane, $C_5H_5N{:}BH_3$ (colorless liquid) are available now in moderate quantities. Larger quantities will be produced at our new Lawrence plant later this year. Other Amine-Boranes will be prepared as compounds with different properties are needed. We'd be glad to hear of your requirements for other Amine-Boranes.

Q. Can you make Amine-Boranes using primary amines?

A. At room temperature primary amines yield aminoboranes; at higher temperatures borazines or boron-nitrogen polymers result.

Q. How stable are the Amine-Boranes to heat?

A. Trimethylamine-Borane can be heated for many hours at 125°C without change. Dimethylamine-Borane starts to lose hydrogen at 80°C to produce aminoborane. Pyridine-Borane does not decompose at 100°C.

Q. What happens to the Amine-Boranes in acid?

A. The Amine-Boranes are stable in glacial acetic acid. Dilute mineral acids hydrolyze them; with Lewis acids diborane is generated.

Q. What are some other solvents for Amine-Boranes?

A. Benzene, ethers and hexane. Pyridine-Borane is also very soluble in alcohol and pyridine.

Q. How stable are these compounds in water?

A. Trimethylamine-Borane loses about 2-3% of its active hydrogen per day. Higher tertiary Amine-Boranes should be even more resistant to hydrolysis.

Q. Are the Amine-Boranes toxic?

A. Yes, but by the use of standard safety procedures the hazards are readily controlled. Animal toxicity figures are available.

Q. You mentioned stabilization. What do you mean?

A. Methyl methacrylate is inhibited against polymerization at room temperatures for a year. Also, Amine-Boranes slowly reduce aldehydes, ketones and some peroxides, and prevent their accumulation in systems subject to auto-oxidation.

Q. Is there much interest in the Amine-Boranes?

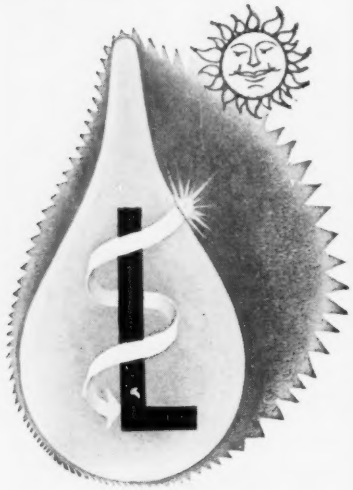
A. Yes. We've answered over 1000 inquiries in the past six months from a wide variety of industries and are now beginning to get promising reports on the samples out for evaluation.

Write or phone for specific information on the Amine-Boranes

Phone FOrest 4-1130 TWX: Perrysville, Pa. 117

CALLERY
CHEMICAL COMPANY
PITTSBURGH 37, PENNSYLVANIA

New unique, economical source of Amino Acids



L—*Leucine*
L—*Isoleucine*
L—*Tyrosine*
L—*Phenylalanine*
L—*Methionine*

STA-MINO®

Here is one of the richest, yet most economical scources of amino acids known today. Sta-Mino, a mixture of amino acids produced by acid hydrolysis of corn proteins, supplies five major amino acids. All but tyrosine are essential.

Sta-Mino is available in two types: Sta-Mino A, an edible, technical grade and Sta-Mino B, a refined grade, so pure it can be used in pharmaceutical preparations for intravenous feeding.

There are many interesting applications of Sta-Mino products:

- As inexpensive amino acid supplements for human consumption.
- In pharmaceutical preparations, both oral and intravenous.
- In "health" foods.
- As a supplement in poultry, swine and other animal feeds.
- As a starting material for individual amino acids and derivatives.
- As fermentation nutrients.
- In electroplating.

Examine the possibilities of Sta-Mino in your own applications. For technical data sheets and product bulletin write to:

A. E. Staley Mfg. Co., Decatur, Illinois
Branch Offices: Atlanta • Boston • Chicago • Cleveland • Kansas City
New York • Philadelphia • San Francisco • St. Louis

felt visiting Achema was well worth the expense.

Most of the American visitors agreed that the expense of trekking to a once-every-three-years show in Frankfurt is more than paid for in knowledge gained. In addition to the exhibits, lectures on many subjects of technical importance were presented by speakers from 13 countries. Pre-Achema lectures were presented at the World Fair in Brussels.

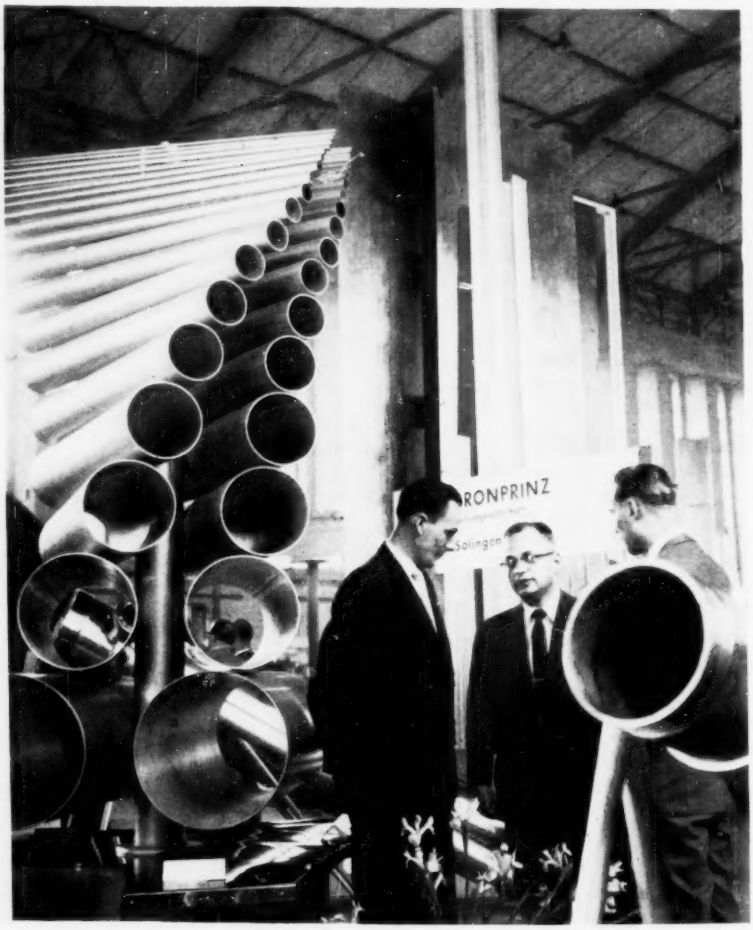
Some firms used the European trip to added advantage. Quinn, John Miskel and Walter Elwood of Pfizer, for example, are now touring European plants to gain knowledge of their firm's foreign operations. Dow's Eichhorn visited Achema as a sidelight. Main purpose of his visit is to study firsthand the European approaches to chemical engineering problems.

Praise—Slightly Tempered: Most Americans interviewed by *CW* had much praise for the show—particularly for its organization, which some felt was worth noting by the U.S. Chemshow planners.

Bill Anderson of Taylor Instruments was impressed by the manner in which firms exhibited—no flowers, no trimmings. "Most of the visitors were interested in what you were showing, not how you were showing it," he said.

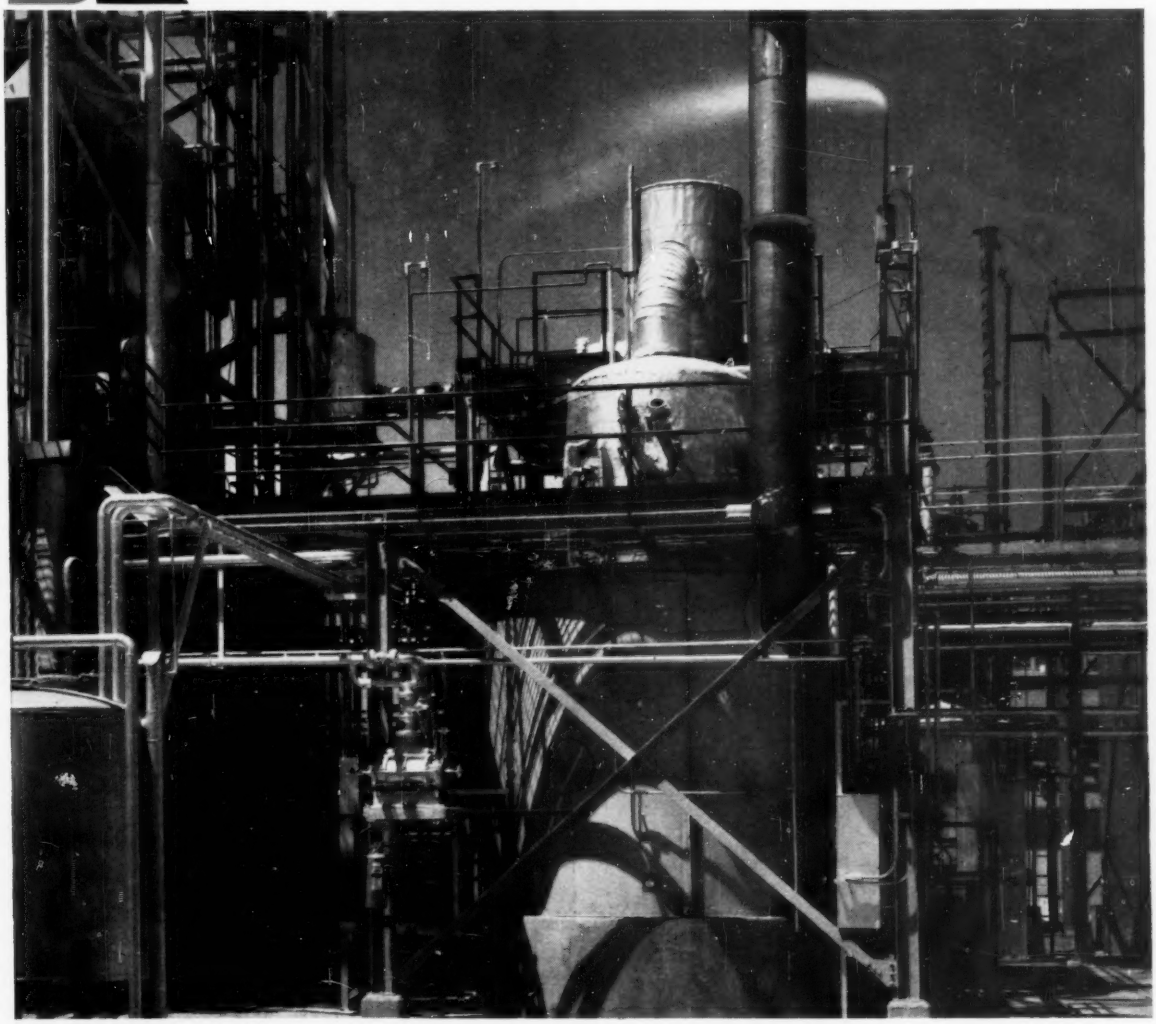
Another comment: most of the personnel manning the exhibits were well versed in their subject.

The plenary lectures at Brussels and Frankfurt were generally regarded highly. One shortcoming: no printed translations available prior to lectures. There was some criticism that a few of the American speakers delivered relatively elementary talks, not up to the standard of the European speakers.



Scientific Design's Landau (center) sees Kronprinz tubing.

Blaw-Knox builds for HumKo, Division National Dairy Products Corp., a radiant heated batch fatty acid still. Supplementing a continuous still previously supplied by Blaw-Knox, this new unit increases HumKo's output of fatty acids and improves production efficiency.



Industry's first radiant furnace cuts fuel costs ... tightens temperature control

New economies for batch fatty acid distillation are introduced with the Blaw-Knox Radiant Furnace. Proven and popular in resin and plastic operations, this unique furnace brings the same design advantages to the fatty acids industry.

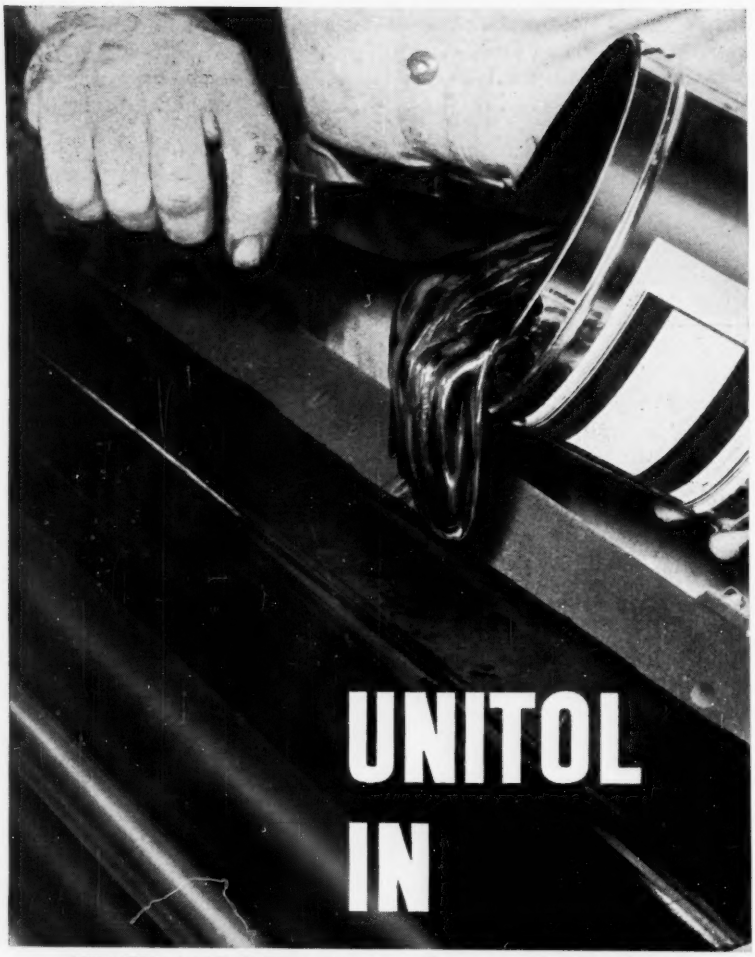
The furnace features a light, stainless steel shell surrounded by light weight, high temperature insulating material. About 75 percent of the heat to the batch is supplied by radiation from furnace walls. This speeds heating and provides improved response to temperature control. Low heat retention and effective insulation cut heat losses, account for significant fuel savings. Reduced maintenance is an added bonus.

The radiant furnace is a pace setting product of a continuing process development program. *Experienced initiative* sparks all projects undertaken by Blaw-Knox's complete engineering and construction service.

When planning your next project—a new plant, or modernization, or expansion, contact Blaw-Knox Company, Chemical Plants Division. Headquarters in Pittsburgh. Branch offices in New York, Chicago, Haddon Heights, New Jersey, Birmingham, Washington, D.C., and San Francisco.

for plants of distinction ...

BLAW-KNOX



PRINTING INKS

helps make lasting impressions

UNITOL tall oil products make low-cost vehicles for several types of printing inks. In many cases, a drying oil or ester gum made from UNITOL is added to the vehicle and pigments to brighten them and secure them more firmly to the sheet.

This is just one example of the variety of industries where UNITOL is helping cut costs. Perhaps it can do the same for you. Write for information, samples and prices.

unitol TALL OIL union camp PRODUCTS

Chemical Sales Division
UNION BAG-CAMP PAPER CORPORATION
233 Broadway, New York 7, N. Y.

PRODUCTION

But the greatest shortcoming in the eyes of most Americans was the lack of representation from the U.S. and its professional societies. As one American summed it up: "The continents' dependence on each other is too obvious to be ignored."

EQUIPMENT

Waste-Heat Reclaimer: For utilizing heat from exhaust steam and hot waste gases at temperatures up to 1500 F, a new fin-tube heat exchanger is offered by Rempe Co. (Chicago). Units, sized for individual applications, are available in copper, aluminum, carbon steel, stainless steel, with open- or closed-shell construction.

•

Nonfreeze Heat Exchanger: New models of heat exchangers specially designed for protection from freezing are now offered by Niagara Blower Co. (New York). In the new sectional Aero models, the air-modulating dampers are enclosed in a casing, and air supply can be restricted by a manually operated damper.

•

Gas Absorber: The Air Cleaning Division of Buffalo Forge Co. (Buffalo, N.Y.) is out with a new gas absorber designed for small process installations. The unit, designed for either acid or alkali gases, has a shell made of ¼-in. polyester-resin bonded fiber glass; interior spray piping and nozzles, and washer-cell frames are made of polyvinyl chloride. First stage has a Monel screen, second stage has fiber-glass filter cells, final stage has a dynel filter cell.

•

Dry-Liquid Mixer: For mixing dry materials with liquids, The American Well Works (Aurora, Ill.) offers a new tank mixer with a high-shear impeller. The impeller rotates within a baffled draft tube at shaft speeds up to 3,500 rpm. Material is drawn down into the suction eye of the impeller, dispersed and recirculated. Mixer is available with tank, if desired.

•

Plastic Drum Filter: A rotary-drum vacuum filter made of plastic for operation under mildly corrosive conditions is a new development of Dorr-Oliver Inc. (Stamford, Conn.). Drum is Fiberglas; its surface is drained through molded-rubber grids, which can be snapped out for inspection and replacement.

ONE OF A SERIES

Printed by offset lithography on 70-lb. paper containing Wyandotte PURECAL® in the coating.

What is a sensible definition of Wyandotte's technical service?

Well, you won't find it in a dictionary.

And you'll be far short of the truth if you decide it's just the name of a department.

Really, it comes down to this: At Wyandotte, technical service means a deep-rooted and sincere desire to be helpful. Any time . . . any place . . . in any way we can. It's a philosophy of doing business that's shared by every man in our organization.

For instance, we are always ready to supply you with information on our products—on their chemical and physical properties along with other pertinent characteristics. We'll suggest ways to handle and store them; and we'll dig deep for data on their specifications and use limitations.

Naturally, our science-specialists* are at your disposal, too—ready to consult with your researchers on any problem that may suggest the use of one or more of our products. (In several cases, this type of consultation has led us to develop an entirely new product designed to solve the customer's problem!)

Helpful? . . . well, most of our clients have found it so. And that's why we, at Wyandotte, give technical service such a broad definition.

If you would like to take advantage of this service, just send us all the background information you can on your product or processing problem. We'll be happy to work with you.

For a pictorial presentation of Wyandotte at work, turn the page.

*Chemists, chemical engineers, physicists, etc., whose industrial or research experience qualifies them as specialists in their particular field.

WYANDOTTE CHEMICALS

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • MURIATIC ACID • HYDROGEN • DRY ICE GLYCOLS • SYNTHETIC DETERGENTS (anionic and nonionic) • CARBOSE® (Sodium CMC) • ETHYLENE OXIDE • ETHYLENE DICHLORIDE • PROPYLENE OXIDE • PROPYLENE DICHLORIDE • POLYPROPYLENE GLYCOL • DICHLORODIMETHYLHYDANTOIN • CHLORINATED SOLVENTS • OTHER ORGANIC AND INORGANIC CHEMICALS

Assisting at the birth of a new product

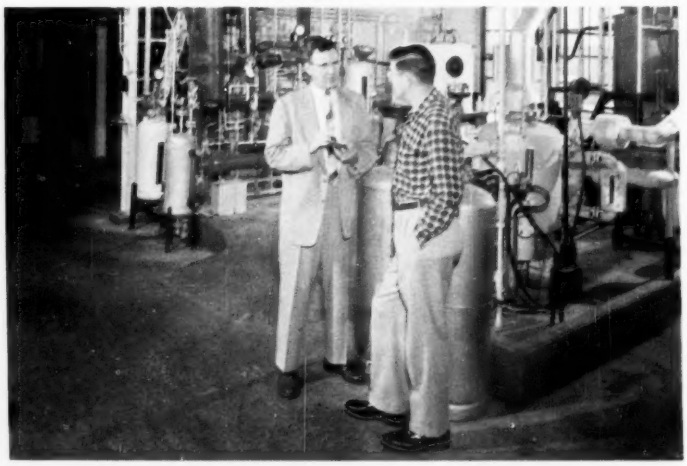
. . . an example of Wyandotte technical service at work

1 "We are developing a new product," a typical inquiry begins, "and are looking for a surface-active agent with dispersing properties superior to those presently on the market." Enclosed was full information.

2 With the need for a new raw material established, background data are withdrawn from Wyandotte's files as a basis for studying problems inherent in producing it.

3 Teamwork: There's a meeting between members of research, production, and sales departments to determine feasibility of entering into new-product production.

4 After our research tests confirm Wyandotte's laboratory candidate as the proper raw material, technical-service man requests prospect's further evaluation and confirmation. He further discusses volume requirements, potential growth.



5 New product shows important, growing market. Before full-scale commercial manufacture of the raw material is started, details of production are worked out in Wyandotte's pilot plant. This step, taken with all new products, assures manufacture is possible on a volume basis at a practical cost.

Wyandotte technical service may show up in the birth of a product, improvement of existing materials, development of new applications or procedures. It's a continuing activity. For, everyone at Wyandotte not concerned with routine administration or production is devoted to helping customers use our chemicals most effectively. If you have a problem within our technological background, check with us . . . our approach is designed to provide answers. *Wyandotte Chemicals Corporation, Michigan Alkali Division, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte CHEMICALS

Pacing progress with creative chemistry

6 Technical-service man draws up final physical and chemical specifications prior to shipment. Samples of pilot-plant production are taken to the prospect for final evaluation.

7 Raw material is approved, and arrangements are made with the customer for initial shipment by technical-service man and representative who will service the account.

537

Technology
Newsletter

CHEMICAL WEEK
June 21, 1958

High-energy, storable, liquid monopropellents are being developed by Wyandotte. Working under a contract with the Navy Bureau of Aeronautics, the company has come up with a system (now under test) involving single fluids that reportedly outperform currently used liquid bipropellents and solids. Goal of the effort: "Fuel-X," with a specific impulse of approximately 300 seconds. (Specific impulse is a measure of thrust; hence, range and other performance characteristics. The best of present propellents are believed to have an impulse around 265.)

It should be remembered, however, that there's a big step between the development of a propellent and its acceptance as a practical power source for rockets. On paper, researchers can demonstrate liquid or solid systems that can provide impulses of 300 or higher. Monopropellents, in particular, are tricky. The more powerful ones are sometimes rather easily detonated. Wyandotte is aware of this, is now working to establish conditions under which detonation cannot occur. And it feels that with monopropellents, it's possible to combine high energy with simplicity of engine design, significantly reduce total weight of rockets.

•

No tanks are needed with a new solid gasoline reportedly developed by Russian scientists. According to *Die Volksarmee* (the magazine of the East German forces) certain undisclosed additives are used to solidify gasoline, allow it to be transported and stored without tanks at —60 to 50 C. The gasoline is reliquefied before use by a press that can be installed in planes, cars and tractors. "Excellent" results are claimed for the new gasoline at the Soviet Antarctic station. The Russian Academy of Science in Pala last year reported making solid gasoline using plastics *(CW Technology Newsletter, July 20, '57).*

•

Chlorophyl is popping up again in medical news. Chlorophyllin may help speed the healing of infected wounds by locally inhibiting blood clotting, according to three investigators at the Veterans' Administration Hospital at Fort Howard, Md. They found that sodium-copper chlorophyllin slows clot formation by the blood's fibrinogen. They theorize that local application of chlorophyllin in an open wound will control inflammation.

Other researchers, at the VA Hospital in East Orange, N.J., report that healing of a wide variety of wounds and ulcers is promoted by an ointment containing the proteolytic enzyme papain along with urea and water-soluble derivatives of chlorophyll.

•

Two developments in glass and glass-lined equipment for labs and production plants came out of upstate New York last week.

From Pfaudler (Rochester) came news that from now on all of its process equipment will be lined with its new Glasteel 59, said to

have 30% greater thermal-shock resistance, 20% greater abrasion resistance than previous glass linings. The new glass is also said to extend corrosive-service life—acid temperature range can be extended to 450 F and alkali resistance is about twice that of hard-glass labware.

At Big Flats, just outside Corning, the "world's largest" plant for fabricating laboratory glassware and glass process equipment was officially opened last Saturday by Corning Glass Works, will turn out about 10,000 different items of glassware.

Two novel nuclear fusion systems currently under construction at Germany's Tuebingen and Munich universities were standout attractions at the recent Achema Fair (*see also p. 63*). Allgemeine Elektricitats-Gesellschaft (AEG) displayed demonstration models of both processes with which Germany hopes to match fusion progress of other nations.

One system is an "impulse condenser battery" designed to produce temperatures required for nuclear fusion (details of maximum temperatures were not disclosed) by impulse discharge of a battery of forty, 40,000-volt condensers. The second apparatus is described as a neutron generator (or ion accelerator) that employs fusion as a source of extremely fast neutrons for scientific research. In the latter system, deuterium ions are accelerated by a 200,000-v. charge and shot against tritium ions to produce neutrons at an energy level of 14.2 million electron volts (mev.).

•

A new step forward in ceramic coating research (*CW, June 14, p. 49*) has been unveiled by Bettinger Corp. (Waltham, Mass.). Result may be a saving in missile weights. Bettinger's new coating is for magnesium-thorium alloy developed by Convair Division, General Dynamics (Pomona, Calif.). The alloy is lighter and stronger than either aluminum or magnesium, but it's soft. A 0.001 to 0.002 in. coating reportedly increase its tensile strength, abrasion-, corrosion- and erosion-resistance.

•

Merck will unveil clinical particulars on its new potent anti-arthritis steroid, this week.

•

Allied's capacity for polyethylene was "substantially increased" at Tonawanda, the company reports this week. It also reports that 200,000 ft. of pipe made from its resin have been installed in chemical plants. The pipe has demonstrated a lack of stress-cracking, freedom from slitting and pinholing as well as exceptional temperature-, chemical- and abrasion-resistance, says the firm.

•

Inflation note: Patent-searching fees charged by U.S. Patent Office go up from $1.50/hour to $3/hour (or fraction thereof) on June 29.

Swift passes operating economies on to you...

SWIFT & COMPANY ANNOUNCES

THE LOWEST PRICES ON RED OIL SINCE 1954...

...MORE

SWIFT & COMPANY ANNOUNCES THE

HIGHEST QUALITY RED OIL IN COMPANY HISTORY

it's confirmed...

SINCE MARCH 7, 1958 Swift & Company has reduced prices on Oleic acids and tallow fatty acids by 20% and has been able to effect a similar reduction in stearic acid prices.

This move is made possible by important improvements in our double solvent extraction process. Resulting operating economies have made it possible for Swift to offer you 1958 high quality . . . at 1954 low prices.

Swift's Fatty Acid Price List No. 11 will make interesting reading for processors who seek to hold prices *and profits* . . . in today's economy. It may also make it unnecessary to settle for substitute materials. Write for a copy today. SWIFT & COMPANY, Technical Products Dept., 1800 - 165th St., Hammond, Indiana.

Swift
103RD YEAR

To Serve
Your Industry Better

0-35

Olin Mathieson Chemical Corporation

MATHIESON POLYETHYLENE GLYCOLS

POLY-G 1000, POLY-G 1500 and POLY-G 01130

A highly individual approach characterizes many technical data sheets. Here's how four firms handle a short-form product bulletin.

◀ *PRODUCT DESCRIPTION, new uses are featured in Mathieson polyethylene glycol data sheet.*

Technical Bulletin

SUN OIL COMPANY INDUSTRIAL PRODUCTS DEPARTMENT

SERVICE FACTORS get emphasis on front side of Sun Oil data sheet for anhydrous ammonia. ▶

HARWICK STANDARD CHEMICAL

Bulletin

◀ *PROPERTIES are stressed after brief description in this Harwick Standard bulletin.*

MONOAMMONIUM PHOSPHATE, NH4H2PO4

VICTOR CHEMICAL WORKS

EQUAL TREATMENT is given to each subject in Victor's monoammonium phosphate bulletin. ▶

Data Sheets—A Case for Conformity?

Should the now widely used and highly individualistic one- and two-page technical data sheet be standardized in terms of subject-matter organization? Interest in that question increased appreciably this week with circulation of a new National Industrial Advertiser Assn. report on how chemical companies handle such data sheets.

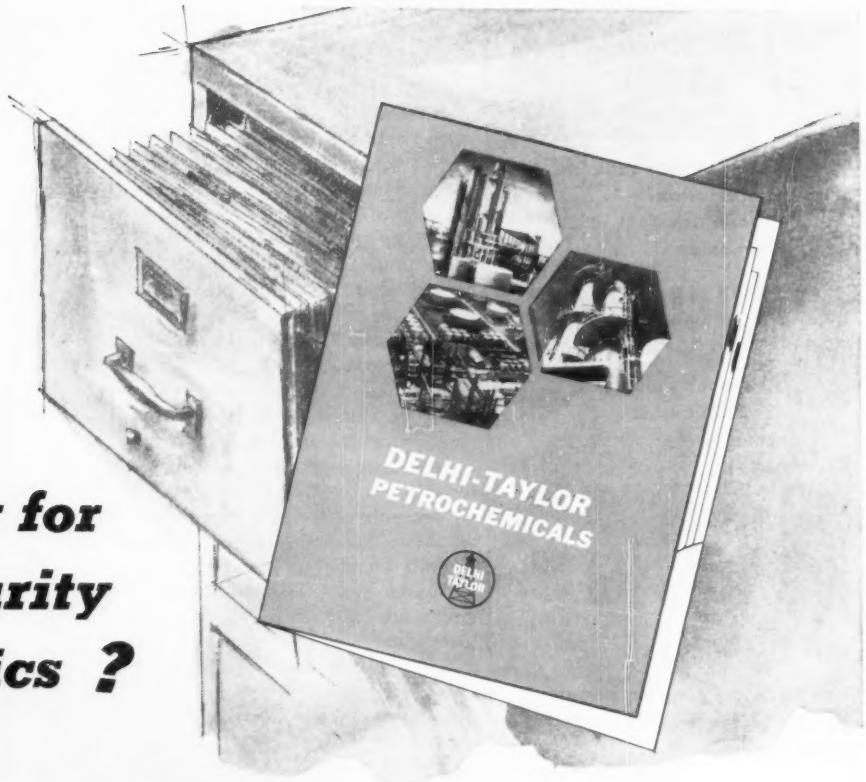
The report stresses the limited role advertising departments now play in processing data sheets—especially those issued during the early phases of a product's development. The report's authors suggest that a standard format might prove useful to sales or research personnel in collecting information. It might also improve coordination with the company advertising department.

The suggested guide presents, in order, product name, product description, applications, properties, processing, space for miscellaneous information of company sales office addresses, and a legal disclaimer.

Right now, only a limited degree of standardization exists. Most companies, for example, use 8½ x 11 in. paper and many provide three-hole punching on the left margin. Most bulletins begin with a brief description of the product. But after that, organization of content varies considerably from company to company (*see cuts*). Many firms, however, have standardized by using a single form for all their product sheets.

Flexibility Remains: Proposals for standardization are generally limited to contents organization only; that is, nomenclature, product description, etc., should appear in the same relative position on all data sheets. Standardization of presentation of physical constants (e.g., number of boiling points to be given) is considered impractical.

Proponents of the highly standardized data sheet claim several ad-



Looking for High Purity Aromatics ?

Reach for DELHI-TAYLOR's Petrochemical File

BENZENE

TOLUENE

XYLENES

Our Petrochemical File Folder is the handy way to keep up to date on Delhi-Taylor's high purity petrochemicals and petrosolvents.

Included in the folder are complete specifications of Delhi-Taylor nitration grade benzene and toluene, 5° xylene, special solvents and mineral spirits. Specification sheets on new Delhi-Taylor products will be issued to you automatically for inclusion in your product file.

Be sure to get your copy of the Delhi-Taylor Petrochemical File and get on our mailing list for new and improved chemical products. Write to Chemical Division, Dept. M, Delhi-Taylor Oil Corporation, 415 Madison Ave., New York 17, N.Y.

DELHI TAYLOR

CHEMICAL DIVISION

DELHI-TAYLOR OIL CORPORATION

415 MADISON AVE. • NEW YORK 17, N. Y.

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caustic soda
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nitric acid
carbon dioxide
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NOW?

Tank truck and tank car shipments from six plants assure immediate delivery when you . . .

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New York	PLaza 3-0700
Pasadena	Ryan 1-7477
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INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.
6236

vantages for their plan:

• Preparation. Standardized formats would tend to systemize collection of data, give researchers a clear-cut procedure to follow and eliminate omission of pertinent facts.

• Promotion. Designed by advertising professionals, the standardized format would insure a professional appearance for all data sheets and proper use of company trademarks and logotypes.

• Utility. Users of data sheets would be able to compare one company's product more readily with that offered by a competitor. The buyer, for example, would not have to look on one side of a sheet for one specification, on another side of a competitor's bulletin for the same data.

Dissent: Sizable as these advantages are, many advertising managers feel that standardization may generate more problems than it solves. For example, there would be some loss of corporate identity—all data sheets would tend to look and read alike. Some feel, too, that standardization might tend to reduce frequent updating of data sheets.

Standardization also might spur conflict between company divisions; a format suitable for one division may not be suitable for others. The biggest drawback, however, centers about the relative importance of the information to be presented. For some products, the chemical properties may offer the most potent sales message; for others, the physical constants may be more important. A uniform order of presentation would in some cases tend to minimize the most important data.

Despite the divergence of opinion, there is some belief that uniformity may be feasible in mechanical aspects (size, type style, type size, etc.) and possibly for older, established products. In the latter case, physical and chemical characteristics are well known, hence there's less advantage to be gained by stressing any particular property.

Outlook: Standardization of data sheets will clearly depend on the potential benefits. Many ad managers would like to see a comprehensive study of all the implications inherent in standardization. That would be the task of a national trade organization. Until then, standardization is likely to be slow to come.

FOR DIFFICULT DEODORIZING TRY

"A to Z" Odor Mask

the new, all around masking agent from D&O

An effective, all around masking compound is truly rare . . . but **A to Z Odor Mask**, the new deodorizing agent developed by D & O, fills every qualification for the job. **A to Z Odor Mask** is the product of extensive basic research on the subject of odor masking plus years of practical experience in the intricacies of industrial perfuming. A general, all purpose deodorant compound, **A to Z Odor Mask** is available in four different forms, each providing a specific end-fragrance effect. Depending upon the subject product and manufacturer preferences, **A to Z Odor Mask** will cover and reodorize to a final fragrance type of fresh mint #50; fruity #14; clean and sharp #22; or fresh, outdoor #40. For those difficult deodorizing problems, may we suggest that you try **A to Z Odor Mask** . . . a true, all-purpose deodorant. Trial quantities and specifications on request.

Our 159th Year of Service

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flavor bases
dry soluble seasonings
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Essentially for you

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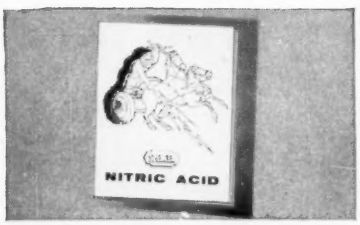
Sales Offices in Principal Cities

"... and don't ever put two purchasing agents in the same room again!"



Write for your free copy of Spencer Chemical Company's new 16-page Nitric Acid Booklet.

NEED NITRIC ACID?...

You can be sure of getting fast, dependable nitric acid service when you contact Spencer Chemical Company. Spencer produces nitric acid in four specific gravities—36°, 38°, 40°, and 42° Baumé. Get the complete facts by writing for Spencer's new Nitric Acid Booklet. A copy will be sent you without obligation.

SPENCER

"Tanky"... The Symbol of Spencer Service

SPENCER CHEMICAL COMPANY

America's Growing Name in Chemicals

SPENCER PRODUCTS: Ammonia (Commercial, Refrigeration and Metal Treating Grades) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Synthetic Methanol • Formaldehyde • FREZALL (Spencer Dry Ice) • Liquid CO_2 • Cylinder Ammonia • Nitric Acid • "Brickaid" Brick Additive • "Poly-Eth" Polyethylene • Spencer Nylon • "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL (Spencer Nitrogen Solutions)

GENERAL OFFICES: Dwight Bldg., Kansas City 5, Missouri

DISTRICT SALES OFFICES: 500 Fifth Avenue, New York City; First National Bank Bldg., Chicago, Illinois; Candler Bldg., Atlanta, Georgia; Union Planters National Bank Bldg., Memphis, Tennessee

Air pollution complaints from civic authorities, calls from irate neighbors about offensive odors are now a thing of the past in many progressive plants. Workers come and go without changing clothes, without griping about the smells they carry home. Efficiency has picked up, good labor is easier to get. That's because low-cost **ALAMASK**® re-odorant chemicals have been added to the company's manufacturing operations.

When offensive odors from your manufacturing processes or plant wastes interfere with community acceptance and plant efficiency, call on Rhodia for help. We'll analyze your problem and show how an Alamask can take care of it—whatever the source of the odor may be. Alamask-ing is routine today in many progressive companies in the chemical, petroleum, rubber, paper, paint, food, etc., industries.

There are Alamasks designed for every essential industry with non-essential odors.

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60 East 56th Street • New York 22, N. Y.
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Lithium Corp.'s Elizabeth Bergmark clinches sale.*

Girls Get Their Chance

On the road this week for Lithium Corp. of America are two newly appointed "salesmen," Elizabeth Bergmark *(above)* and Gladys Serum *(right)*. Both are former LCA secretaries. Now, they're division sales managers.

Miss Bergmark will direct foreign sales from the company's New York office; Miss Serum will handle a Minnesota-Iowa-Wisconsin territory. Supervisory responsibilities are limited, for the time being, to secretarial personnel. Although neither has chemical background, both acquired substantial understanding of LCA products and their industry uses in their previous jobs and through customer requests.

That led LCA to let them try their powers of persuasion on plant purchasing agents. Says LCA Vice-President J. Douglas Campbell, "I expect they will do very well."

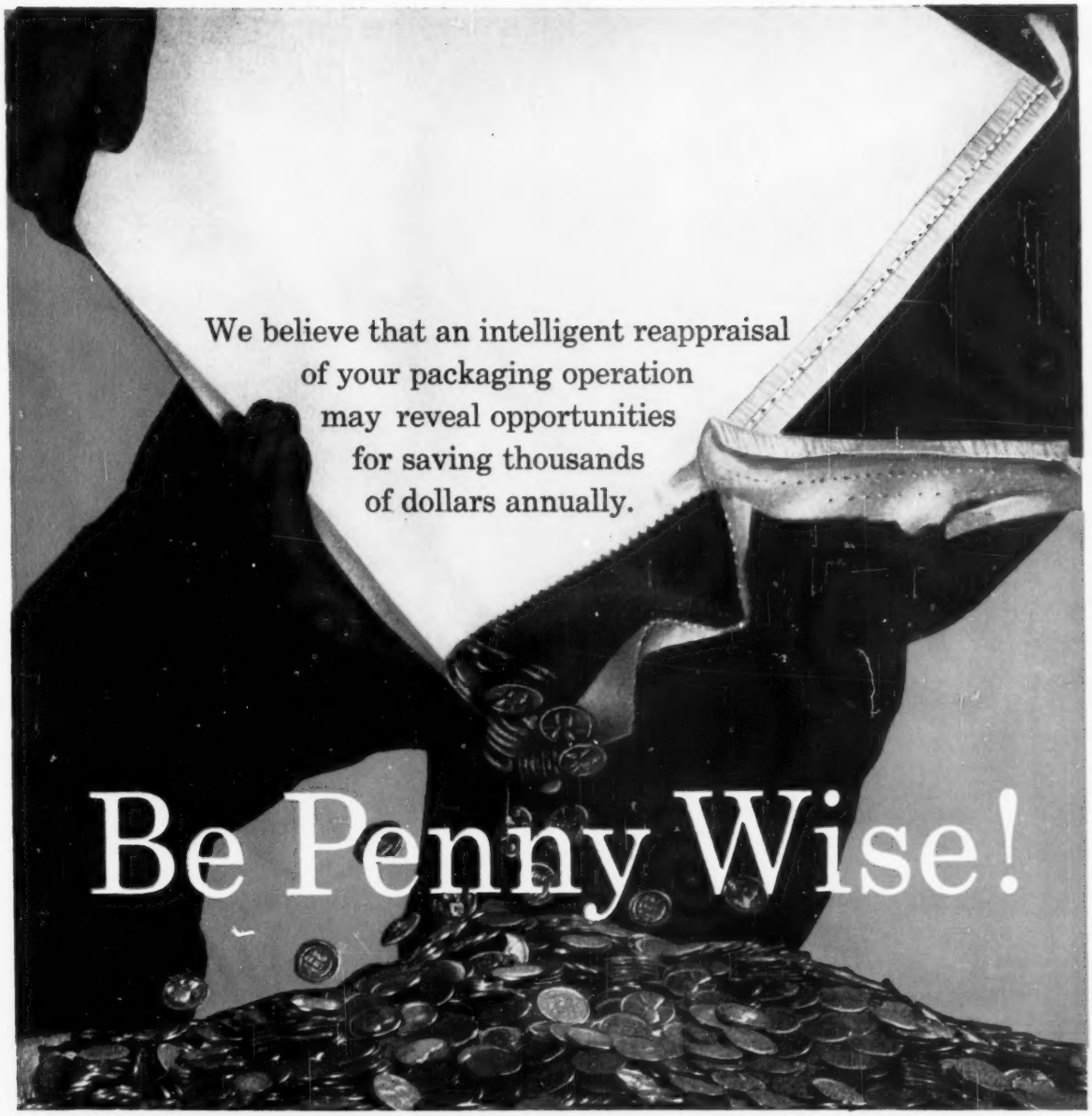
The only problem to date stems from tradition: many purchasing agents (especially foreign buyers) are reluctant to let distaffers pick up the luncheon tabs.

In the field, there are few problems: the women clamber over process equipment and wait their turns in the buyers' waiting rooms—just as their male counterparts do.

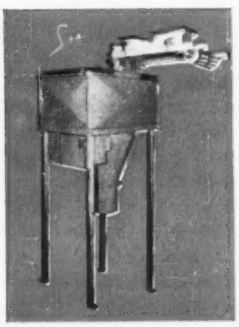
Miss Bergmark and Miss Serum are among the very few full-fledged female sales representatives in the basic-chemicals industry. L. Sonneborn Sons, Inc., has a female traffic manager; and Lederle Laboratories, division of American Cyanamid Co., employs a woman as a purchasing agent.

Gladys Serum covers Lithium's three-state Midwest territory.

*To Continental Ore Corp.'s John Keller.



IN BUYING MULTIWALL BAGS NO SAVING IS TOO SMALL TO IGNORE!



THE KRAFTPACKER Open Mouth Bag Filling Machine, for free-flowing material, automatically saves pennies, too, through higher production and greater accuracy. Requires a lower investment and maintenance cost than any other automatic machine of its type in use today!

KRAFT BAG CORPORATION
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630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Integrated mills at St. Marys, Georgia and Gilman, Vermont
Exclusive Sales Agents for Kraftpacker

Show me how to save on my multiwall bag packaging.

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Cellured Corp.
• Kraft Bag Corp.

COMPANY.....

ADDRESS.....

CITY..... ZONE..... STATE.....

PRODUCT MFD.....

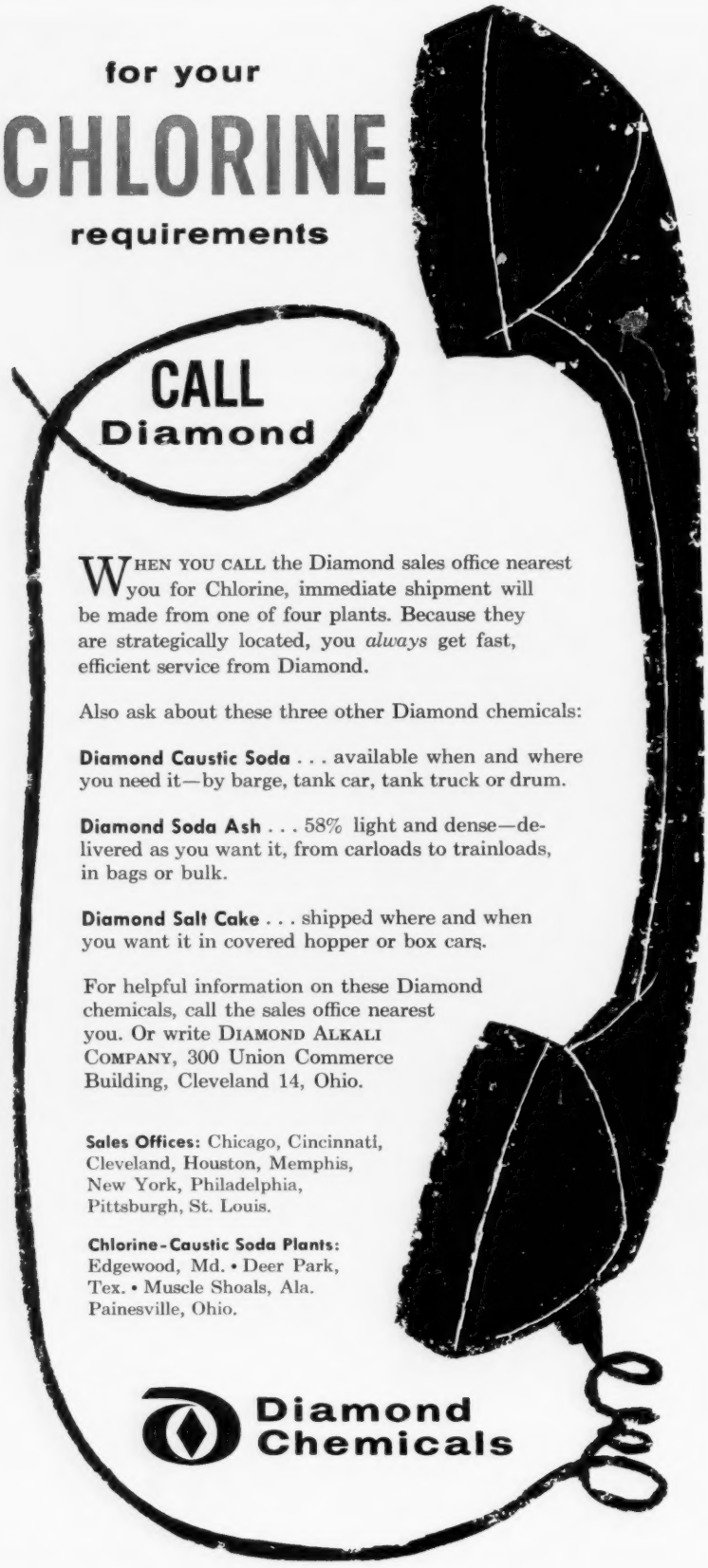
NAME.....

CW

for your

CHLORINE

requirements



WHEN YOU CALL the Diamond sales office nearest you for Chlorine, immediate shipment will be made from one of four plants. Because they are strategically located, you *always* get fast, efficient service from Diamond.

Also ask about these three other Diamond chemicals:

Diamond Caustic Soda . . . available when and where you need it—by barge, tank car, tank truck or drum.

Diamond Soda Ash . . . 58% light and dense—delivered as you want it, from carloads to trainloads, in bags or bulk.

Diamond Salt Cake . . . shipped where and when you want it in covered hopper or box cars.

For helpful information on these Diamond chemicals, call the sales office nearest you. Or write DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Sales Offices: Chicago, Cincinnati, Cleveland, Houston, Memphis, New York, Philadelphia, Pittsburgh, St. Louis.

Chlorine-Caustic Soda Plants: Edgewood, Md. • Deer Park, Tex. • Muscle Shoals, Ala. Painesville, Ohio.

Diamond Chemicals

SALES

DATA DIGEST

• **Crotonic Acid:** Reactions of the acid's double-bond and carboxyl group are discussed, along with its potential uses as an intermediate for molding polymers and copolymers, protective-coating resins, insecticides, lube-oil additives and plasticizers. Bibliography, specifications and physical data also included. Eastman Chemical Products (Kingsport, Tenn.).

• **Chemical Intermediates:** Bulletin discusses physical and chemical properties and potential uses of maleuric acid, N-carbamyl maleimide, maleurate esters, mixed nonyl phenols, mono- and dibenzylamines, octyl- and dodedecyl chloride and mercaptan, 2-chloroethyl chlorosulfonate, tetrachlorohydroquinone and *p*-nitro and *p*-amino diphenylamine. Naugatuck Chemical Division, U.S. Rubber Co. (Naugatuck, Conn.).

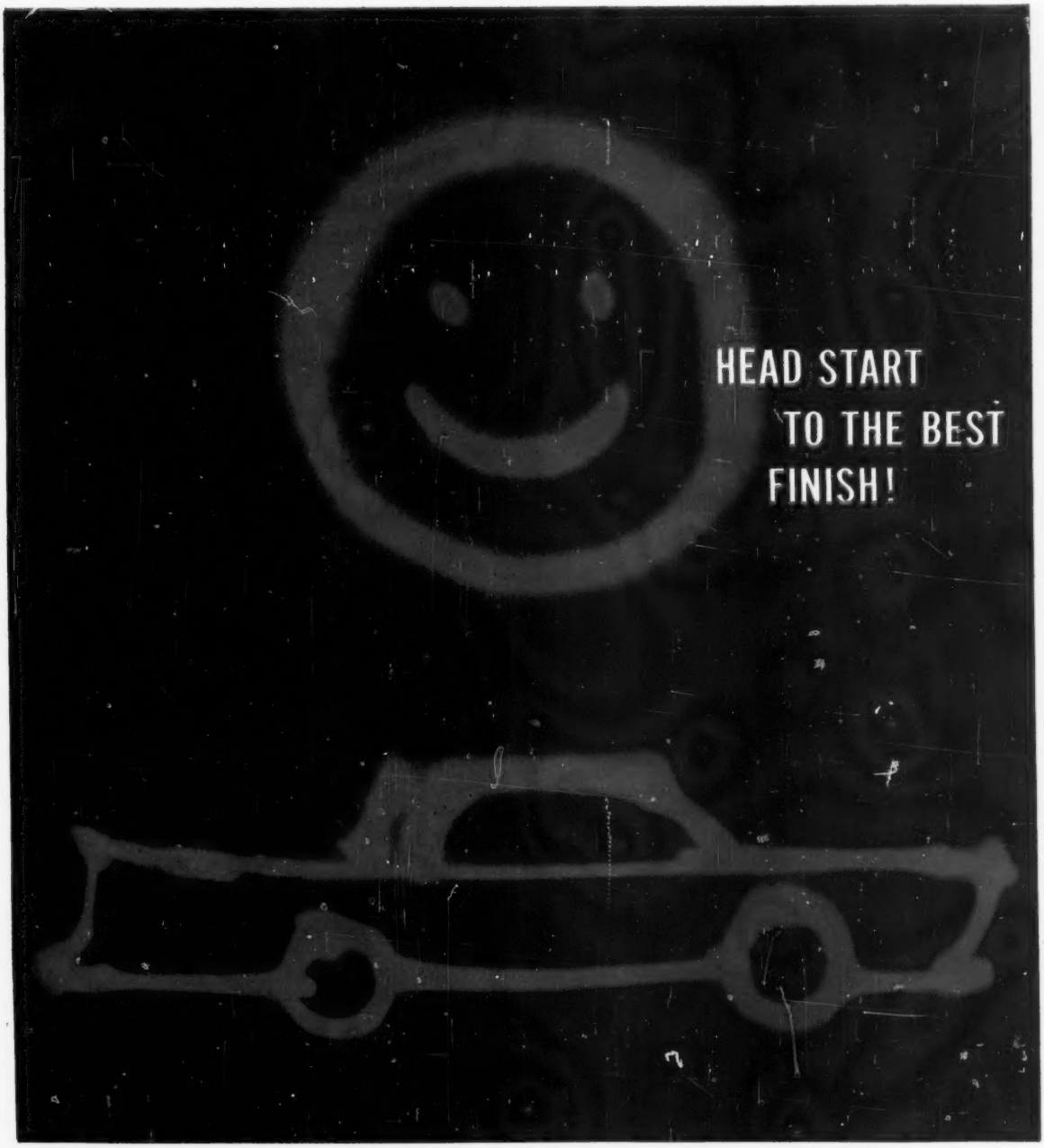
• **Soy Proteins:** Three bulletins outline properties of isolated soy proteins. Adpro 112 (medium molecular weight) is suggested for uses in adhesives, latex paints, paper coatings and emulsion stabilization where solubility at mildly alkaline pH is desired; Adpro 220 (high molecular weight and viscosity) is suggested for heavy gel dispersions; Adpro 410 (low viscosity) is offered for coatings, inks and other applications where water resistance is necessary. Archer-Daniels-Midland (Minneapolis).

• **Coating Latex:** Sixteen-page brochure gives physical properties, typical formulations and other data for Dylex Latex K-52, a fortified and stabilized, styrene-butadiene copolymer latex for paper coating. Chemical Division, Koppers Co., Inc. (Pittsburgh).

• **Closures:** Sixteen-page booklet presents evaluation of methods used to close fiberboard boxes. Acme Steel Co. (135th and Perry Ave., Chicago).

• **Allyl Alcohol:** Chemistry and applications of allyl alcohol in resins, drugs, flavorings and perfumes are outlined in a new technical booklet. Dow Chemical Co. (Midland, Mich.).

• **Adipic acid:** 77-page hard-cover book gives data on physical properties, solubility, stability, chemical reactions and compatibility of adipate esters with various resins. Included: list of adipic acid derivatives and brief discussions of suggested applications. Polychemicals Dept., Du Pont.



Solvesso 150 has long been a standard solvent in baking-alkyd surface coatings used in the automotive industry. Unsurpassed in uniformity and purity, it is an outstanding member of the high-quality Esso family of aromatic solvents, the solvents that set performance standards *throughout* the paint and surface coatings industry. Esso's excellent customer service combines with the most modern handling methods and key distribution centers to assure you of a constant supply and *immediate* delivery. For a head start to the best finish, always specify Esso Petroleum Solvents. Write, wire or phone today! Esso Standard Oil Company, 15 West 51st St., N. Y. 19, N. Y.

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PETROLEUM SOLVENTS

Unlike their counterparts in other industries (right), CPI researchers seldom cash in on authorship.

Incentives Spark a Research Writing Boom

Researchers are turning out more technical articles this year than last, according to a new, nationwide CW survey on employee authorship in chemical process firms. And vigorous management support is clearly responsible for the trend (see box, p. 86).

Behind this support is the belief that these publications enhance the reputation of both the company and its personnel, recognition so valuable that more and more companies are lending time, personnel and facilities —and in some cases even making cash awards—to promote the work.

But there's one area in author development where the CPI lags: as shown by an all-industry survey made recently by the National Industrial Conference Board (NICB), Inc. (New York), the salient difference in author incentives in chemical and other industries is money. Cash awards for authorship are more plentiful outside the CPI.

There are, of course, several reasons for this attitude. An important one is that financial incentive in the CPI generally comes through salary increases.

Publicity vs. Security: Of course, active encouragement of authorship can lead to problems. Once it is decided that publicity is desirable, the problem of patent security is raised—how much can be revealed about a company's process, for example. Some firms report that disclosures are confined, in general, to methods of chemical analysis or similar areas of study.

The over-all attitude of chemical process companies toward employee authorship is pretty much typified by that of Armstrong Cork Co. (Lancaster, Pa.). Armstrong comments, "We do encourage our technical people to publish research findings, but, in many cases, patent clearance is necessary before publishing. We have no particular policy regarding incentives, but the more prolific authors receive higher salaries as a natural consequence of their doing more creative work.

"If the author works on an article or book for which he is to receive money from the publisher, then he is asked to do the writing on his own time. If, on the other hand, we have an interest in the employee's publishing an article or book for which he will receive no compensation, we allow him to prepare the article on company time and our facilities are made available to him.

"We believe that our technical writing has increased in the past year due to our general policy of encouraging employees to publish their findings."

Independent research laboratories, included in the survey, feel their publishing opportunities are comparatively limited.

Evans Research and Development Corp. (New York) explains, "An independent industrial research laboratory is limited in opportunities to publish, since findings are the property of clients. Therefore, we encourage publication wherever possible."

Arthur D. Little, Inc. (Cambridge, Mass.), on the other hand, reports, "We do not have to encourage our staff members to report their findings or to write articles, except for those who find writing a painful process or who are simply swamped with work."

A. D. Little's crop of technical papers rose 17% in the past year. Evans, in spite of its handicap, turned out 50% more. Increases as high as

BROAD SPECTRUM

From Borax to Boranes... Trona's program covers the whole broad spectrum of boron chemistry*

Trona today is working in boron on a scale unmatched by any other producer in the field, spanning the whole of boron's broad spectrum. Trona's basic research program is in the forefront of modern boron development. That is why, wherever boron is used—in commercial products for everyday living or in high energy fuels for the Space Age—Trona's vast experience and production capacity can be put to work for you. For specific problems involving boron we suggest you contact your Trona representative today.

*TRADENAME AND TRADEMARK OF APACC

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OFFICES: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (O.), SHREVEPORT

These World Famous Firms came to Pennsylvania and took advantage of

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- Plus many, many more!

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LABOR:
Abundant—Skilled—Productive
Send for New "Scranton Labor Market Skill Survey"

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TRANSPORTATION:
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SCRANTON HAS THE PERFECT SITE FOR YOUR NEW PLANT

We will build a modern plant to your specs. You build your equity as you pay rent, and a provision in your lease will let you buy your plant any time for the unpaid balance. Write today for details of "The Scranton Plan."

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  99.5% Minimum purity
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  Available in Crude, Bulk, Liquid
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How Chemical Companies Help Researchers Turn Author

97% encourage writing and also allow use of company facilities for it.
94% allow writing to be done on company time.
9% consider a researcher's publications in promoting him.
48% believe publications help achieve professional recognition.

100% (Chemstrand Corp.) and 33% (Smith Kline & French Laboratories) are reported by "captive" labs.

Money Makes a Difference: Impressive as these gains are, they pale beside increases scored by some nonchemical respondents to the NICB survey. Staffers of Convair Division of General Dynamics Corp. (San Diego), for example, more than quadrupled their technical writing in 18 months, after Convair established a writing award fund in May '56 *(also see p. 88)*. All employees are eligible, except those who prepare articles for outside publications as part of their regular duties.

At Convair, employees write the articles on their own time and must confine their subject matter to aviation-related fields, electronics or management. For any article that is accepted by a recognized trade or technical publication, the author or authors receive $150 at the time of acceptance. However, recipients aren't allowed to keep any payment made by the publication. The award program is administered by the public relations department.

One CPI equipment firm, Worthington Corp. (Harrison, N.J.), under an awards plan that's nearly 20 years old, pays employees an initial fee of $50 for articles approved by a special committee. The latter consists of a headquarters staff engineer, the general marketing manager and a representative of the advertising dept. If the article is published, the author gets an additional $25. And he apcives $25 each time the article appears in any recognized publication.

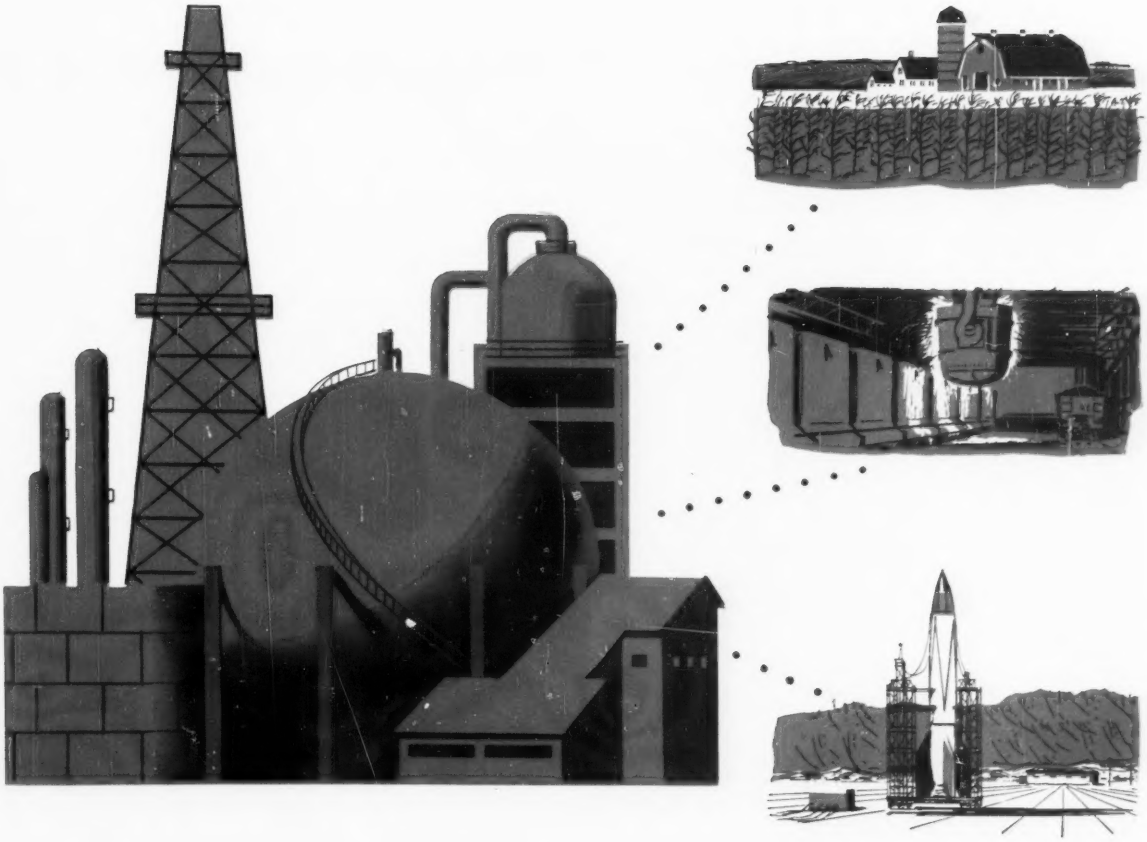
Since the first of this year, Dravo Corp. (Pittsburgh) has had a plan under which cash awards are made for each article published in a suitable journal. Previously, Dravo paid annual prizes totaling $1,200 on the basis of competition. Winning technical papers were picked by a committee of junior management personnel of the company.

Bucking the Trend: One CPI firm that does pay cash to its technical authors, according to the NICB survey, is Carborundum Co. (Niagara Falls, N. Y.). Articles are channeled through the firm's technical editor, who reports to the head of the public relations branch of the company's marketing division. The latter obtains necessary clearances and handles arrangements with magazines or newspapers. NICB reports, "Any payment that the publication makes to the author reaches him through the public relations branch.

"If the publication does not pay for articles, Carborundum pays the employee a sum determined by the originality and length of the article, the extent of independent effort the author put into it and how effectively he presented his material. The company also supplements payments made by publications when it is believed that the amount is inadequate. Papers that have been delivered at meetings of technical and professional societies and published in their journals are considered articles, just as those that appear in trade publications."

Westinghouse Electric Corp. (Pittsburgh) permits its employee authors to accept payment for technical articles. But if the publication offers no payment, the company pays the author an honorarium of $20 for the first printed page; $15 for the second; $10 for the third; $5 for the fourth; and $2.50 thereafter.

Both *CW*'s and NICB's surveys reveal there are many ways to induce researchers to publish—not the least of which is company assistance and guidance in the preparation of articles. But cash awards, largely neglected in the CPI, are an incentive that's hard to top.



Atlantic makes Anhydrous Ammonia for every use

Anhydrous ammonia is a versatile chemical raw material. It is used in the manufacture of fertilizers, stainless steels, plastics and rocket fuels—to name only a few of its industrial applications.

Whatever use *you* have for it, Atlantic is ready to supply it promptly . . . *and* to provide expert technical assistance in its applications.

Anhydrous ammonia is only one of the Atlantic family of petrochemicals. Both industry and agriculture are constantly finding new and profitable uses for Atlantic petrochemicals, which are characterized by uniform quality and stable supply.

For more information on anhydrous ammonia and other Atlantic petrochemicals, write or wire Chemicals Division, The Atlantic Refining Company, 260 South Broad Street, Phila. 1, Pa.

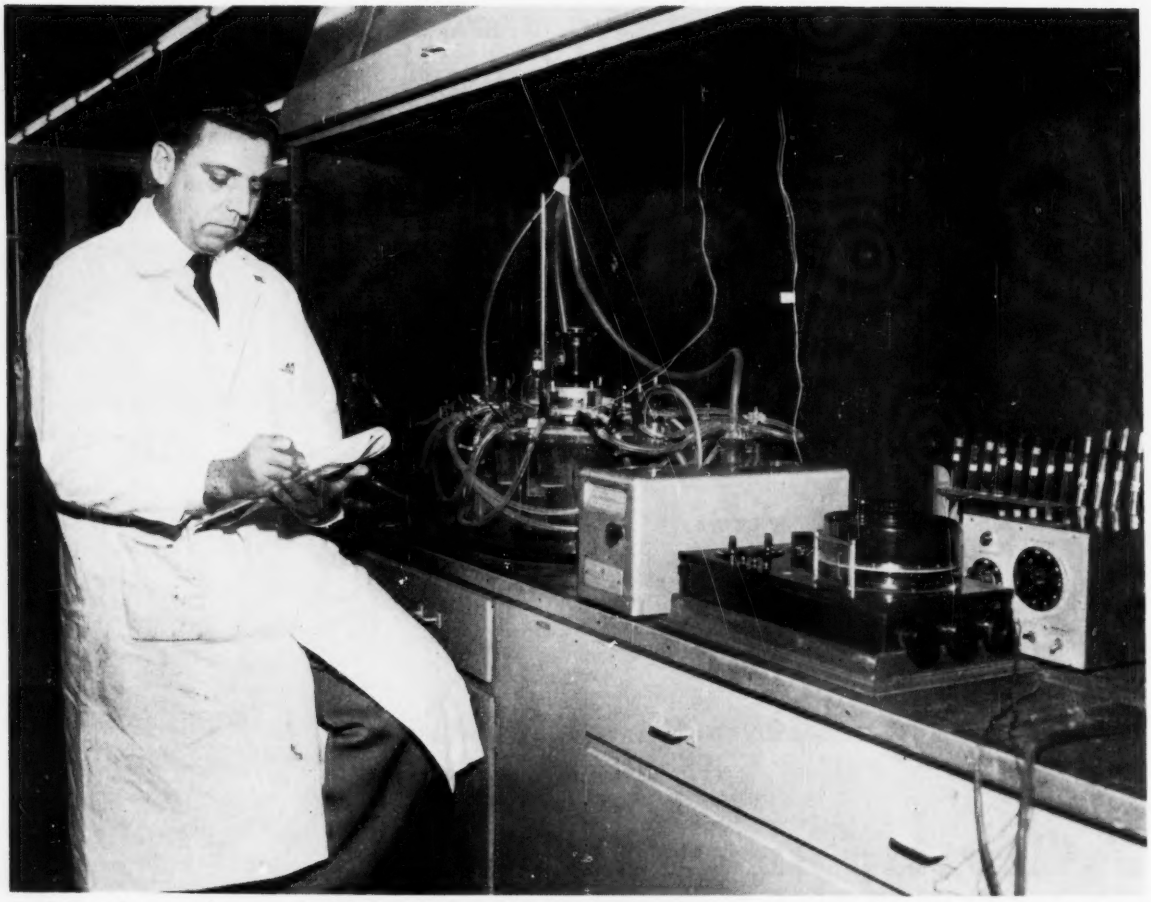
ATLANTIC PETROLEUM CHEMICALS

Philadelphia, Providence, Charlotte, Chicago

In Canada: Naugatuck Chemicals Division of Dominion Rubber Co., Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro



Earl Gray's experience as initiator of Convair's unusual pick-your-own-experiment group proves . . .

Pet Projects Can Yield Handsome Payoffs

Convair Division's (General Dynamics Corp.) unique plan to permit the company's engineers and other nonresearch personnel to undertake scientific projects of their own choosing is beginning to pay big dividends in chemical research.

The plan was initiated two years ago when Earl Gray *(above)*, an engineering department chemist, started a two-year study of the thermodynamic properties of metal sulfides *(CW, Oct. 13, '56, p. 86)*. He's terminating his project in two months, but there are still some 22 research programs working, five of which are in chemical research.

In the past two years, airplane-maker Convair says, it has gained two significant chemical advances from its program: a shock-tube for high-temperature aerochemistry research and an evaluation of the thermodynamic properties of very-high-temperature air, such as that produced in an H-bomb explosion. The latter work was done by Adolph Hockstin, a physicist, as an extension of work on the Wizard, an antimissile missile.

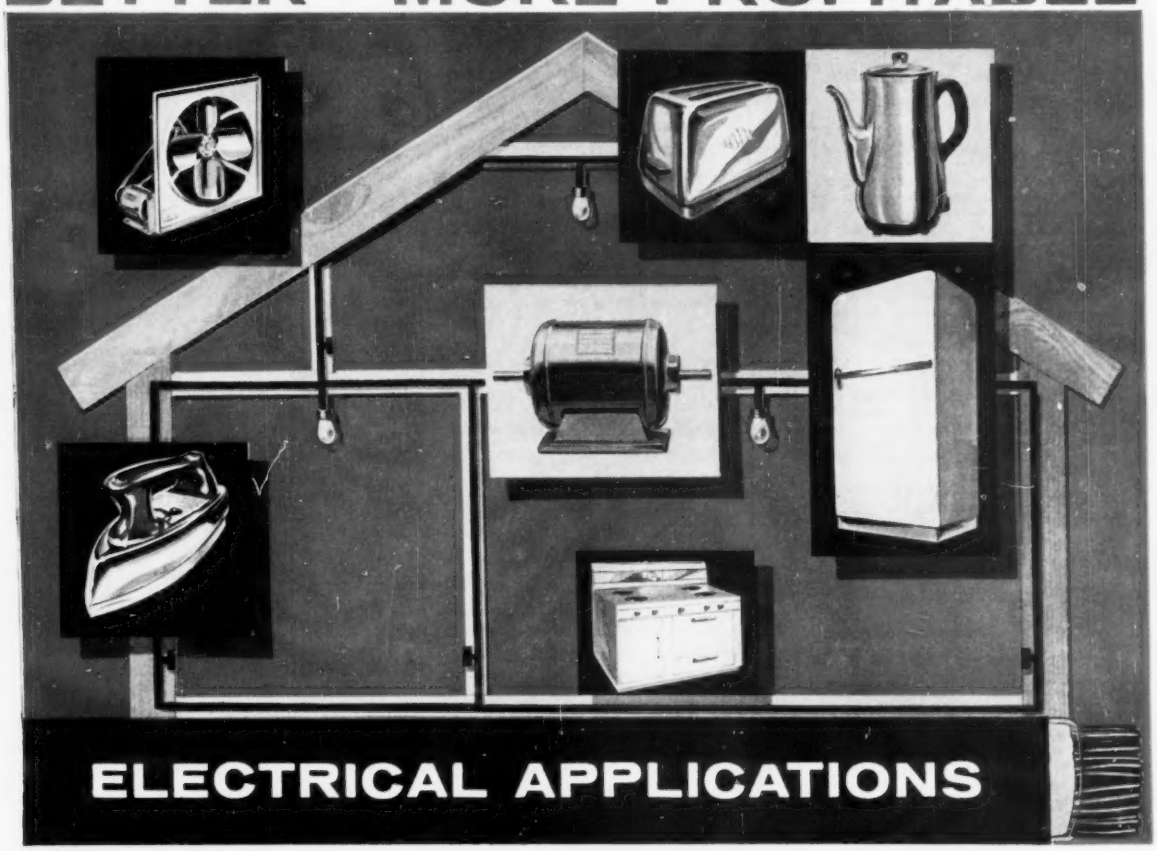
According to William Dorrance, assistant to the director of Convair's scientific research department, the program works this way: Engineers submit their ideas to the company's scientific research staff. These proposals are generally related to problems growing out of work at hand. If the idea is okayed, it may be pursued on company time. Almost all of the work is on the pure-research level.

Other chemical projects under way at Convair include physicist J. R. Streetman's study of the effects of radiation on materials in electronics and hydraulics systems in aircraft; and chemist George Abel's investigation of the effect of high-energy electrons on the thermodynamic properties of metals. Even mathematicians get into the act—Donald Robey, for instance, is studying the stability of materials in space, a chemical problem. Convair, confident that results will be forthcoming, allows them to work full time on these pet projects, spends $20,000-25,000 on each project that's undertaken.

Rewarding Effort: Staffers approved for participation in the program are never hurt financially by their shift to research. Their pay is the same, and if their regular division earns overtime pay, so do they.

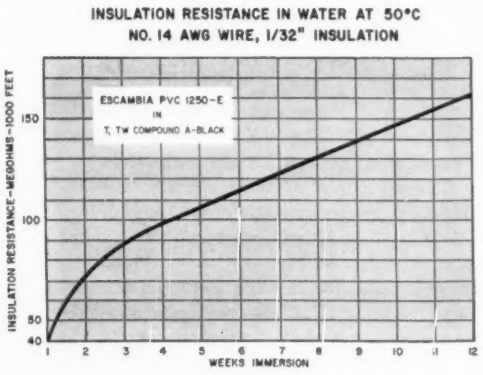
If the researcher does well, he gets a bonus, promotion or raise. If process patents are forthcoming, the re-

BETTER • MORE PROFITABLE



With ESCAMBIA PVC 1250-E

OUTSTANDING INSULATION RESISTANCE WITH THIS EASY PROCESSING RESIN



Electrical properties and product quality your customers want and money-saving processing advantages for you—that's what you get with ESCAMBIA PVC 1250-E.

This resin is now on the UL interchangeability list—ready to bring you products that will please your customers and profits that will please you. See for yourself what this resin can do—make a trial run in your plant now.

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Need A Versatile Thermally-Reversible GELLING AGENT?

SeaKem Gelling Agents produce firm water gels at low concentrations — as little as 1.0% — which provide these special advantages:

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- Character of gel can be varied from "short" to highly elastic texture.
- Discontinuous gel (broken up gel structure) has thixotropic properties useful in many applications such as stabilization of foams, emulsions and suspensions.
- Has unique property of complexing with proteins and certain other materials to make highly useful systems.

Write today for fully descriptive technical literature on SeaKem products. Experimental samples also gladly furnished.

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AIR LINE RAILROAD
Through the Heart of the South

RESEARCH

searcher gets all the royalties from licensees, although Convair uses the process free.

Dorrance feels that the program helps to pinpoint talent in the company, that it's also a great morale booster, has decreased the loss of scientific talent. He adds, "There is a big backlog of employees waiting to try their hand at research." As sales grow, the program will likely be expanded.

EXPANSION

- Carpenter Steel Co. (Reading, Pa.) is now using its new corrosion research laboratory, plans corrosion research on use of steel alloys based on titanium, Zircaloy, zirconium and nickel in chemical and petrochemical process equipment.
- Spectrochemical Laboratories Inc. (Pittsburgh) is moving to new quarters in that city, will increase its services to industry.
- Leeds & Northrup Co. (Philadelphia) has turned the spade on a new research analytical equipment and instrument center at North Wales, Pa., hopes to move in by spring of '59.
- Industry is supporting Rutgers University's (Newark, N.J.) newly offered courses in the chemistry of perfume and essential oils. Givaudan-Delawanna, Inc., Hoffmann-LaRoche Inc., Firmenich Inc., Leonhardt Inc., Norda Essential Oils and Chemical Co. Inc., S. B. Penick & Co., Shulton, Inc., The Trubek Laboratories, van Ameringen-Haebler, and the Verona Chemical Co. are in the program—they do perfume business in the New York-New Jersey area valued at $25 million/year.
- Air Reduction Chemical Co., a division of Air Reduction Co. (New York) plans a new "$1-million-plus" research laboratory and pilot plant at Piscataway Township, New Jersey.
- British Petroleum Ltd. has completed an analytical lab at its Sunbury (England) Research Station. The lab is part of a $4.5-million expansion of BP's research activities
- Stauffer Chemical Co. (New York) will build a process development laboratory at its Richmond, Calif., research center. Work now being carried on at the company's Torrance, Calif., location will be moved to the new $100,000 lab upon its completion in September.

PRODUCTS

Rocket Fuel Additives: Hummel Chemical Co. (New York) is offering in research quantities some 18 compounds suggested for use as rocket fuel additives. They include five alkyl nitrates, five nitrides, two nitro compounds, amorphous boron, boron fluorammoniate, aluminum sulfide, antimony pentoxide, silicon chlorammoniate and sulfur monobromide.

●

Fatty Acid: Wilmar Di-Oleic is a new high-molecular-weight di-basic fatty acid sold by Wilson-Martin Division of Wilson and Co. (Philadelphia). Uses: urethane foams, corrosion inhibitors, coatings, plasticizers.

●

Sulfate Sleuth: J. T. Baker Chemical Co. (Phillipsburg, N.J.) now offers a "fast, sensitive reagent for sulfate determinations." It's called barium chloranilate reagent powder, is available in 10- and 25-gram packages.

●

New Nitrides: High-purity titanium and zirconium nitrides are now offered by Hummel Chemical Co. (90 West St., New York 6, N. Y.).

●

Chloride Entries: Isophthaloyl chloride and terephthaloyl chloride are now offered with minimum purity of 98% by Hooker Electrochemical Co. (Niagara Falls, N. Y.). They're suggested as raw materials for fibers, films, coatings, etc.

REPORTS

These Atomic Energy Commission reports in chemistry are available from the Office of Technical Services, U.S. Dept. of Commerce, Washington:

- "The Chemistry of Tributyl Phosphate: A Review" (HW-40910, 55¢); "A Kinetic Study of the Reduction of Uranium Oxides with Hydrogen" (HW-46685, $1); "An Apparatus for Determining Total Gas in Fuel Element Samples" (HW-51452, 50¢); "Standardization of Plutonium Solutions by Ignition to the Oxide" (HW-51822, 50¢); "Thermal Stability of Hydrous Aluminum Oxides (KAPL-1740, $1); "Methods of Analysis of Anisole-BF_3 Solutions" (ORNL-2014, 75¢); "Studies Relating to the Structure of Aluminum Hydride" (UCRL-8089, $2.50); "Method of Estimating Heat Formation of Inorganic Compounds" UCRL-8152, $1.50).

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

June 21 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1958

New Electron Beam Melting And Casting Process Gives High Purity Special Metals

A new process employs electron beam bombardment in a high vacuum to melt special metals such as titanium, zirconium, tantalum, molybdenum, columbium, beryllium and vanadium. A company to commercialize this process has just been formed jointly by Stauffer Chemical, Temescal Metallurgical and Mallory Sharon Metals (the last named company is owned ⅓ by U.S.I.).

Techniques have been developed which permit certain impurities to be volatilized and removed, yielding metals of unusually high purity with properties not attainable by other methods. The process will make these high purity metals available for the first time in commercial quantities.

In this process, heat for melting is supplied by an electron gun which serves as the cathode and bombards the melt stock (the anode) with electrons, heating it to the melting point. Molten metal drops into a water-cooled

MORE

AEC Plans Another Sodium-Cooled Reactor Experiment

The Argonne National Laboratory has announced that a second Experimental Breeder Reactor (EBR-II) will be constructed at Arco, Idaho. It will be sodium-cooled with an electrical power output rated at 20,000 KW, and is expected to go critical in June 1959. Arco is also the site of Experimental Breeder Reactor-I, which is cooled with a sodium-potassium mixture and has an output of 15,000 KW.

The purpose of EBR-II will be to develop engineering and operation information which can be applied to full-size, central-station power plants. This reactor will contain complete fuel processing and fabrication facilities, heat transfer systems and steam electric plant.

Metallic sodium makes an excellent coolant because of its relatively low neutron-absorbing characteristics, good heat transfer properties, low melting point and high boiling point. High temperatures without high pressure can be produced when sodium is used as coolant.

MORE

New Coating Protects and Decorates Polyethylene

Films and molded products made of any type of polyethylene can now be decorated and/or protected with a new synthetic coating which is applied by dip or spray techniques. The material, tradenamed NYLENE, is reported to impart a hard, glossy finish and to increase clarity of polyethylene products. Excellent adhesion, flexibility and scuff resistance are claimed, along with resistance to a wide range of solvents. The new coating also acts as a vapor barrier.

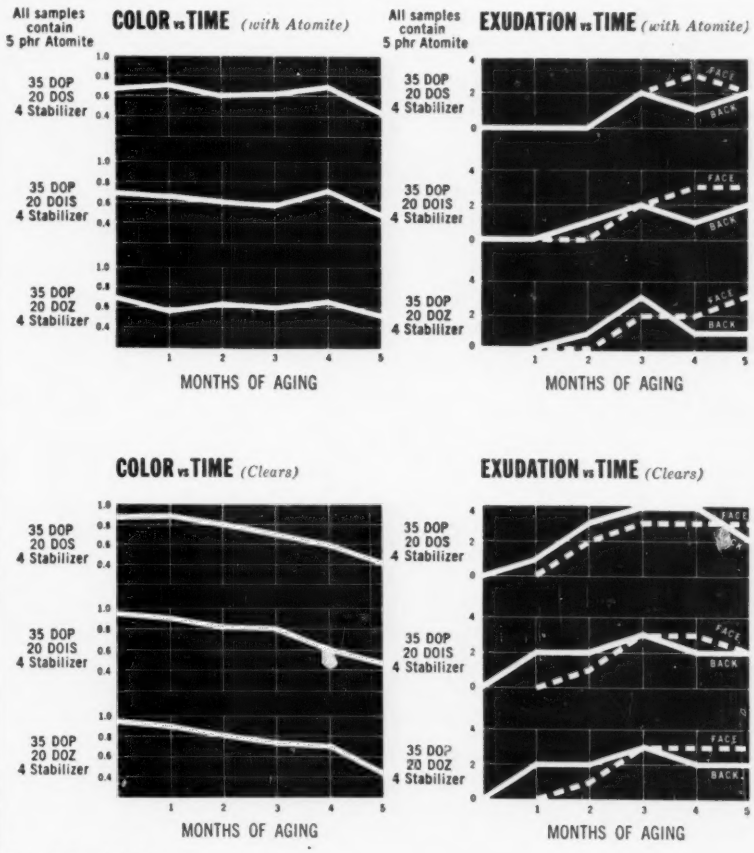
Because the coating can be tinted in any color, and combined with metallic powders, it is suggested for decorative purposes.

Advantage of Isosebacate Plasticizers Shows Up in Aging Tests on Vinyl Film

Dioctyl Ester of ISOSEBACIC® Acid Comparable to Corresponding Esters of Sebacic, Azelaic Acids in Performance, Lower in Cost

A five-month series of aging tests was conducted recently in Southern Florida by an independent research laboratory to determine color stability and exudation rates in vinyl films containing various plasticizers. In these tests it was demonstrated that the dioctyl ester of ISOSEBACIC acid is comparable in performance to the same esters of sebacic and azelaic acids when used as vinyl plasticizers. At the same time, the ISOSEBACIC acid ester is lower in cost.

The charts below show actual test results. ISOSEBACIC acid, a mixture of C-10 dibasic acids, was developed in the U.S.I. research laboratories. A commercial plant for production of this intermediate is being started up at U.S.I.'s Tuscola, Ill. chemical complex. Samples are available on request.


All samples contain 5 phr Atomite
COLOR vs TIME (with Atomite)
All samples contain 5 phr Atomite
EXUDATION vs TIME (with Atomite)
35 DOP 20 DOS 4 Stabilizer
35 DOP 20 DOIS 4 Stabilizer
35 DOP 20 DOZ 4 Stabilizer
FACE
BACK
MONTHS OF AGING
COLOR vs TIME (Clears)
EXUDATION vs TIME (Clears)
Note: 1.0 = Colorless
DOP — DIOCTYL PHTHALATE
DOS — DIOCTYL SEBACATE
DOIS — DIOCTYL ISOSEBACATE
DOZ — DIOCTYL AZELATE
PHR — PARTS PER HUNDRED RESIN

Charts courtesy of Deecy Products Company

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June 21 ★ **U.S.I. CHEMICAL NEWS** ★ 1958

CONTINUED

Electron-Beam Melting

copper crucible below and is not contaminated by the crucible.

Electron beam melting is said to offer several important advantages over vacuum arc melting. Operations can be stopped and started at any time. Materials can be melted in any form: ingot, powder, flake or sponge. Under the conditions existing in the furnace, gaseous impurities are removed rapidly as suboxides to leave behind the pure metal.

The process can also be used for zone refining. There is no apparent limitation on the diameter of the bar or ingot that can be processed, and so a large quantity of purified metal can be turned out in a relatively short time.

The new process will be licensed to interested industrial and research concerns.

Non-Beverage Alcohol Regulation Clarified

A new ruling by the Alcohol and Tobacco Tax Division of Internal Revenue clarifies a 1956 regulation concerning the filing of alcohol formulas when a company changes ownership. Revised Ruling 58-123 states that when a non-beverage manufacturing operation undergoes a change in proprietorship, and the new owner wants to use the alcohol formulas filed by the preceding owner, he must follow one of two procedures.

He can submit new formulas in his own name on Form 1678, Formula and Process for Non-Beverage Product, to replace those submitted by his predecessor. Or he can adopt the formulas already on file by submitting an affidavit to the Assistant Regional Commissioner, Alcohol and Tobacco Tax, stating that the preparations covered by formulas submitted by the prior owners, and on file with Internal Revenue, will be made in accordance with such approved formulas and processes.

The affidavit must identify the formulas by serial numbers and names of products. The original and two copies go to the Assistant Regional Commissioner who sends one copy to the Director, Alcohol and Tobacco Tax Division. A fourth copy should be retained by the manufacturer.

CONTINUED

Sodium in Reactors

Four other U.S. sodium-cooled reactors range in status from operational to the development stage. They are:

Sodium Reactor Experiment, Santa Susana Mts., Cal. — sodium-graphite reactor — 7,500 KW (operational)

PRDC Fast Power Reactor, Monroe, Michigan — fast breeder reactor — 100,000 KW (under construction)

Consumers Public Power District, Hallam, Neb. — sodium-graphite reactor — 75,000 KW (design stage)

Chugach Electric Association Reactor, Anchorage, Alaska—heavy water-moderated, sodium cooled—10,000 KW (development stage)

Chemical P.A.s Meet With Market Research Group

The Chemical Buyers Group of the National Association of Purchasing Agents met for the first time with the Chemical Market Research Association in Washington recently.

It was felt that market research groups can help P.A.s in major purchasing decisions, particularly in the "make-or-buy" area. Chemical buyers said that today they need information on distribution, consumption and future market trends as much as skill in negotiation in order to make intelligent, profitable purchasing decisions.

Conversely it was felt that P.A.s can give market research men data on current conditions, for developing market forecasts.

SOLOX® Denatured Alcohol Proves Versatile on Boats

With the boating and fishing season now getting into high gear, U.S.I.'s general purpose denatured alcohol solvent SOLOX is becoming increasingly popular with boat owners and campers. SOLOX has many cleaning uses — for wiping off sanded wood before painting, to dry the wood and clean out dust at the same time; with soap to wash painted surfaces; with water for cleaning glass; full strength for cleaning motors and ignition parts.

SOLOX is also an efficient fuel, and igniter for fuel, in boat and camp stoves.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Triethylborane is now being supplied in sample quantities for study as a catalyst for polymerization of unsaturated monomers, as a jet fuel or fuel component, and as an igniter or flame-speed accelerator. **No. 1360**

Equipment for radio-active operations is described in a new book now being sold. The volume contains some 60-odd papers delivered at the Hot Laboratories and Equipment Conference held as part of the 1957 Nuclear Congress. **No. 1361**

Thermoplastic adhesive in dry, 100% solid, continuous cord-like form, is now being marketed with applicator especially designed for controlled feeding, melting and applying. Claimed to bond polyethylene films, coatings, papers, boards, foils, glassines at 250 ft./min. **No. 1362**

Air pollution is the subject of a free, 20-page booklet just issued to help develop fair and workable air pollution laws. Principles essential to such legislation are defined. Procedures for formulating these laws are outlined. **No. 1363**

New corrosion-resistant, thermosetting coating for chemical plant floors is said to resist strong acids, alkalis and solvents, withstand temperatures of 230 F, support heavy traffic. Sets quickly to durability of good concrete. **No. 1364**

Carbon-14, tritium and sulfur-35 samples in solid, liquid and vapor phases can be measured for radioactivity with new dynamic condenser electrometer. With flow chamber, instrument claimed ideal for industrial gas monitoring. **No. 1365**

New adhesive for laminating urethan foam and combining it with all types of surfaces is said to impart immediate high tensile strength and excellent adhesion in heat or pressure-sensitive sealing. **No. 1366**

Encyclopedia of Chemical Technology has just been brought up-to-date through issuance of the first supplement volume to this series. It contains 51 articles covering, among other topics, adhesives, computers, nuclear reactors. **No. 1367**

New portable oxygen indicator is now available for measuring concentrations of oxygen in gaseous mixtures from 0 to 25% by volume. Operates on a single flashlight battery, weighs less than six pounds. **No. 1368**

Zirconium and hafnium technical and application data are covered in a new 16-page brochure now available at no charge. Production, properties and mill shapes available are included, as well as present and future commercial uses. **No. 1369**

PRODUCTS OF U.S.I.

ORGANIC SOLVENTS, INTERMEDIATES

Plastics Intermediates: ISOSEBACIC® Acid, Sebacic Acid.

Alcohols: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil.

Esters: Ethyl Acetate (85-88%, 95-98%, 99%), Normal Butyl Acetate, Diethyl Carbonate, DIATOL® (Diethyl Carbonate Containing About 10% Anhydrous Ethanol), Diethyl Oxalate.

Ethers and Ketones: Ethyl Ether (Technical, Absolute, USP), Acetone (Dimethyl Ketone).

Intermediates and Fine Chemicals: Acetoacetanilide, Acetoacet-Ortho-Chloranilide, Acetoacet-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalactetate, Sodium Ethylate, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P., Pelargonic Acid, 2-Ethyl Heptanoic Acid.

OTHER PRODUCTS

Alcohols: Ethyl (pure and all denatured formulas): Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL PR.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphatic Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sodium Sulfite, Sodium Sulfate.

PETROTHENE® Polyethylene Resins

Animal Feed Products: Antibiotic Feed Supplements, BHT Products (Antioxidant), Calcium Pantothenate, Choline Chloride, CURBAY B-G®, Special Liquid CURBAY, VACATONE®, Menadione (Vitamin K_3), DL-Methionine, MOREA® Premix, Niacin USP, Riboflavin Products, Special Mixes, U.S.I. Permadry, Vitamin B_{12} Feed Supplements, Vitamin D_3, Vitamin E Products, Vitamin E and BHT Products.

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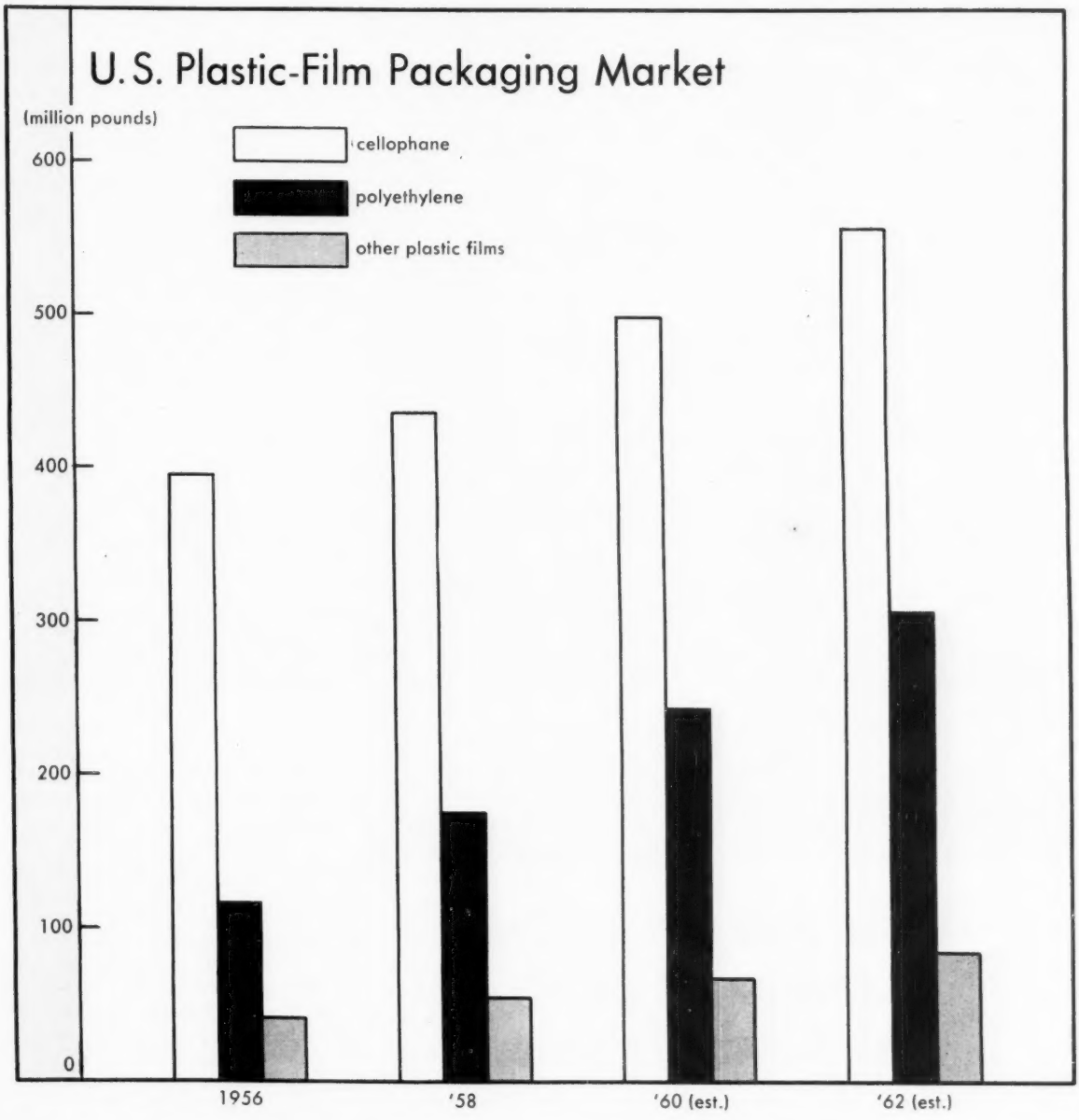

Polyethylene Grows in Triple Time

Makers of plastic films were this week evaluating a startling prediction: U.S. demand for polyethylene film in packaging will jump 110% in the half decade from 1957-62, moving to a record 300 million lbs./year. That's double the growth rate and almost one-third of the total 1-billion-lbs./-year market for all packaging films* that producers expect by '62.

This and related forecasts concerning the role of polyethylene film in the fast-growing U.S. packaging film market are revealed in a comprehensive market analysis by the market development department of Monsanto's Plastics Division. Here—as Monsanto staffers see it—is what's happening in the ebullient polyethylene film market.

Film Family Forecast: Total demand for film packaging materials will increase 54% between '57 and '62. Expected growth rates of individual films will, of course, vary considerably: cellophane, 32%; polyethylene, 110%; rubber hydrochloride (Pliofilm), 61%; vinyl, 110%; vinylidene (saran and Cryovac), 68%; polyester (Mylar), 167%.

In millions of pounds, the '62 de-

*Includes polyethylene, cellophane, rubber hydrochloride, vinyl, vinylidene, polyester, and cellulose acetate.

PHOTO COURTESY OF CHRYSLER CORP.

For finishes and coatings of consistent quality use Sunoco Toluene

Sun Oil Company, the largest producer of high-purity toluene on the east coast, offers the industrial-coatings fields the advantages of its convenient plant location and unsurpassed technical service.

Sunoco® toluene, which meets most A.C.S. reagent-grade specifications, is specified for many exacting finish and coating formulations. Because it is thiophene-and paraffin-free, Sunoco toluene assures you of higher yields, minimum odor, and low evaporation residue.

For complete specifications, see your Sunoco representative, or write to Dept. CW-6.

Industrial Products Department
SUN OIL COMPANY, Phila. 3, Pa.

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In Canada: Sun Oil Company Limited, Toronto and Montreal.

Other Sun petrochemicals: Anhydrous ammonia, benzene, xylene, Sulfonate OS, Sunaptic® (naphthenic) acids, propylene trimer, propylene tetramer, PDO-40 (petroleum drying oil), sulfur.

mand forecast shapes up this way: cellophane, 555; polyethylene, 304; rubber hydrochloride, 29; vinyl, 19; vinylidene, 20; polyester, 8; cellulose acetate, 5; total, 940 million lbs.

The Monsanto team paid particular attention to polyethylene. Polyethylene film for packaging is consumed in two broad markets: (1) established outlets that will continue to expand at an estimated 15-20% annually; (2) new, high-growth outlets in which considerably faster growth is likely.

Here's how some of these outlets look now to Monsanto market men.

Overwrap Penetration: Recent improvements of polyethylene resins for film extrusion may give the plastic a chance to penetrate somewhat into the current 300-350-million-lbs./year automatic overwrap market now almost exclusively held by cellophane.

Continued product improvements and development of suitable automatic packaging equipment will determine the speed with which such penetration will take place.

Bread overwrap offers by far the greatest potential—expected to take 300 million lbs./year of plastic by '62. Already indicating that a major breakthrough into this market has been scored, standard wrapping machines have been adapted to handle polyethylene and some bakeries now wrap specialty breads in poly.

Another important overwrap customer is the textile industry. The potential is estimated at more than 46 million lbs./year. Monsanto's breakdown (million pounds): terry towels, 19.5; sheets, 9.6; wash cloths, 4.6; pillowcases, 4.4; dish towels, 3; blouses, 2.5; sport shirts, 1.4; miscellaneous textile products, about 1.1 million lbs./year.

Dry Cleaning: An estimated 1.5 billion garment bags were used by U.S. laundries and dry-cleaners last year. About 300 million—20% of the total—were made of thin-gauge polyethylene film. And the outlook for growth here is bright. Poly is expected to have more than half the garment-bag business by '59; and its use for this purpose may reach 60 million lbs./year—70% of the total market—by '60, compared with 12 million lbs./year today.

Bagging in Industry: Industrial packaging will be a rapid growth area for 10-mil polyethylene film; poly sacks will first be used for hard-to-

You get more new ideas from DU PONT

FLUOROALCOHOLS

$H(CF_2CF_2)_nCH_2OH$

(C_3 Fluoroalcohol where n=1 and C_5 Fluoroalcohol where n=2)

This new group of intermediates offers unusual solvent properties, low toxicity, a high level of chemical and thermal stability, and a convenient source of fluoroalkyl groups for incorporation into your products.

The fluoroalcohols are a new and novel class of intermediates containing from 57.5 to 65.5% fluorine. Their wide range of chemical properties fits them well for use in a variety of industrial applications.

For example, fluoroalcohols will dissolve many materials including a group of polymers for which no other solvent is known. They're of low toxicity. Their density is exceptionally high which indicates possible value in instrument fluids. And since the fluoroalcohols have the lowest refractive index of known organics, they could be of particular interest to makers of optical products and waxes.

The chemical properties of fluoroalcohols are equally extensive. They can be oxidized to corresponding groups of acids and they can be esterified to yield a variety of products . . . some with useful surface active and thermal properties. They will undergo all the characteristic reactions of alcohols, but their fluorine content modifies their reactivity considerably. The fluoroalcohols are also very useful in introducing fluoroalkyl groups into many molecules.

An impressive list of practical applications for these fluoroalcohols and their derivatives has been suggested. Surfactants, pharmaceuticals, corrosion-resistant coatings and anti-foaming agents are but a very few.

While these alcohols are many times more expensive than ordinary alcohols, they still may be useful to you. Best way to find out is to evaluate a sample yourself. You *might* discover that "quantity X" you've been looking for to complete a product improvement or new process idea. A request on your letterhead will bring a small sample and technical details. Write E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes & Chemicals Division, Wilmington 98, Delaware.

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handle commodities such as flake caustic soda and sodium bisulfate. In addition, polyethylene sacks will probably replace a substantial portion of the 65 million polyethylene-coated kraft shipping sacks now used.

By '62, 100 million polyethylene sacks will probably be required to bag chemicals, agricultural products and foods—a 35-45-million-lbs./year market for polyethylene film.

Established Markets: Of the 56 million lbs. of fresh fruits and vegetables sold annually in this country, about 25% are prepackaged for retailing. Eventually 80-90% of all produce may be prepackaged. Polyethylene is already the favorite material used, has a 60-70-million-lbs./year market.

Monsanto surveyed 104 candy manufacturers—who together represent 40% of total dollar sales in that industry—and learned that 58% of them use some type of plastic packaging; 45% use polyethylene bags. Of the others, 20% are seriously considering use of plastic packages.

Cost Tumble: In '52, the price of 1½-mil polyethylene film was roughly 40% higher than that of cellophane (300 MS), but it has dropped sharply. Cellophane costs, on the other hand, have increased slowly. In '56, less-expensive poly replaced cellophane, pricewise, and today has a price advantage of more than 9¢/lb. over cellophane. Note these comparisons:

Cost Comparison of Selected Packaging Materials

(Cents per 1,000 sq.in.)

Mylar (Type C)	6.9
Aluminum foil (1 mil)	6.73
Saran (1 mil)	6.4
Cellulose acetate (1-mil cast)	4.2
Vinyl (1-mil cast)	4.0
Pliofilm (80 F mil)	3.3
Cellophane (300 MS)	3.2
Waxed-paper bread wrap (grade 39 lbs.)	2.0
Glassine, waxed (25 lbs.)	1.77
Polyethylene (1 mil)	1.7

Manufacturers of competitive materials insist that price comparisons alone won't determine how the packaging markets will be shared. But at least two points are clearly underscored by the Monsanto survey; the battle for packaging film markets will be hot and long, and ubiquitous polyethylene will be a vigorous contender.

...IN POLYETHYLENE FILM

Here's how The Carborundum Metals Company packages zirconium sponge, a form of metal used in building reactors for nuclear power plants and in chemical processing equipment.

Notice the drum liner—film made of BAKELITE Brand Polyethylene. Highly inert, it keeps the sponge uncontaminated by contact with moisture. It's a strong, tough film, resistant to tearing by the rough surface of the sponge.

With a liner of film made of BAKELITE Brand Polyethylene, a low-cost container can replace expensive special packaging. The film's heat-sealability and resistance to chemicals and moisture safeguard the contents. Its light weight and toughness make handling easy. For all the facts, write Dept. CU-34, Bakelite Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

It pays to package in film made of BAKELITE BRAND POLYETHYLENE

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Agricultural pests fall by the million when sprays containing Emulsol agricultural emulsifiers get to work. These outstanding pesticide emulsifiers were specially developed for use with any type of local water.

Other products manufactured by Witco and its divisions are:

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Emulsifiers and Surface Active Agents for agriculture, foods, cosmetics, and other industries

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chemicals at work

Emulsifiers developed by Witco's Emulsol Division have proved their outstanding efficiency in fields ranging from pesticide spraying, fuel-oil emulsifiers, toiletry manufacture to industrial water treatment. Anionic, cationic and non-ionic, they are tailored to meet manufacturers' specific needs...to provide better products at lower costs.

Emulsifiers are only one product line of one Witco division. Each division manufactures a great many other industrial chemicals in bulk quantities. Stearates, rubber chemicals, asphaltic compounds, carbon blacks, detergents...whatever the product, the name *Witco* guarantees its high quality.

It also guarantees first-class technical service...on call at all times to advise customers on processing or raw materials problems. On your behalf, we will investigate new manufacturing techniques or evaluate old ones.

At some point in your products or processes, Witco chemicals can be of benefit to you. When you buy Witco, you buy highest grade chemicals *plus* unsurpassed service. Write today for details on how Witco and its divisions can contribute to your manufacturing success.

Emulsol's Series 4100 Emulsifiers are widely used by shampoo manufacturers to promote unusually high-foaming properties without irritation to eyes and skin tissue.

Used as an additive for diesel fuels in modern motor yachts and fishing vessels, Emcol H-50A disperses sludge-forming moisture throughout the body of the oil, resulting in smoother running and less chance of breakdown.

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Pound for pound, Micro-Cel gives you far more absorption than common fillers like talc and clay . . . even outperforms products like silica gels selling for as much as 10 times Micro-Cel's delivered cost of 8¢ to 10¢ per pound.

Dollar for dollar, Micro-Cel's high absorption also wins out over both low cost and high cost fillers. Only 28¢ worth of Micro-Cel will convert a full gallon of liquid to a dry free-flowing powder. As little as 12¢ worth provides ultimate absorption of a gallon of water.

Industry is putting these properties of Micro-Cel to work in several types of applications: as an absorptive carrier to convert a liquid to a dry free-flowing powder; as a means of drying semi-solids to desired degree; to disperse liquids uniformly in a dry compound; to absorb moisture and reduce drying costs; to control liquid viscosity up to a paste or semi-solid; to assure good free flow properties of deliquescent crystals or powders.

Micro-Cel, the powder that flows like a liquid is a new line of inert synthetic calcium silicates produced by combining lime with diatomaceous silica under carefully controlled conditions. In addition to high absorption, it provides particle size as small as .02 micron and bulking action up to a full cubic foot for every three pounds.

For further information, samples and technical assistance, write to Johns-Manville, Box 14, N.Y. 16, N.Y. In Canada, Port Credit, Ontario.

One pound of
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absorbs as much linseed oil as these weights of other fillers...
1½ lb. SILICA GEL
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12½ lb. KAOLIN CLAY
14 lb. TALC

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Micro-Cel is a product of the Celite Division

Market Newsletter

CHEMICAL WEEK
June 21, 1958

Agricultural chemical makers are maneuvering to woo customers as the new fertilizer year approaches (July 1). Earlier price lists, for instance, are being sharply reduced by some "to meet competitive conditions."

The nitrogen solutions market is a good example. A couple of weeks ago, Allied Chemical declared that its price of $128/ton (effective from Jan. 1 to the end of June), would be continued through December. But last week, three other producers, in rapid order, lowered prices. New tags: $110/ton for July-September shipment; $114/ton during October-December; and $120/ton for deliveries between Jan. and June '59.

Last weekend, Allied—and others—were mulling over the competitive price situation and chances are that the trade's lower schedules will be industry-wide before the end of this week.

Lower muriate of potash prices anticipated last month (*CW Market Newsletter, May 3*) materialized this week. At least one major producer, American Potash & Chemical, is out this week with quotations at least 2½¢/K_2O unit lower (depending on quantity and contract date) than those announced last year. The company stresses that its potash, which comes out of Trona, Calif., will be priced "to meet the competition of domestic producers at Carlsbad, N.M."

One complaint heard frequently in the trade: it's tougher to sell potash this year because new producers are moving into the field and pushing total U.S. output potential into overcapacity.

Tags on ammonium nitrate and ammonium sulfate are changing. Starting Aug. 1, Monsanto will lop $2/ton off the base price of its nitrate material; that sets the tag at $70/ton. The company's August-December prices under seasonal discount terms, however, work out to $1-4/ton higher than last season's quotes for the comparable period.

Monsanto will also peg the price of its synthetic ammonium sulfate $1/ton higher than the current $34 (bulk, f.o.b. works), on July 1.

Coke-oven ammonium sulfate has been in a bind because of lagging steel production. And it shows clearly in latest government output figures. In March, by-product sulfate production scarcely hit 53,000 tons, a nose-dive from last year's March output of more than 80,700 tons.

Inventories held at producing plants have continued to drop off. That may be one reason behind a major steel producer's hiking the price of large granular sulfate $1/ton (to the basis of $35/ton), shortly after Monsanto's increase. Regular-grade material, however, at last reports, was still being quoted at an unchanged $32/ton price.

Electroplaters get a price break on four chemical products used in the industry. Du Pont made the cuts early last week. Copper cyanide and potassium cyanide are down 2½¢/lb., bringing prices to 60.9¢ and 42½¢/lb., respectively, in amounts of 20,000 lbs. and over. Tags on its Coppralyte plating salt-potassium formulation and sodium-copper cyanide double salt were dropped 1¢ and 1.1¢/lb., respectively. For all but the potassium cyanide, the price cut is the second this year.

•

Major polystyrene producers are pondering Cosden Petroleum's entry into commercial production soon. Concern centers on a Cosden price list that's been circulating for some months. A related poser: Who will buy the estimated 20 million lbs./year slated to pour out of its new Big Spring, Tex., plant?

Industry-wide, general formulation prices are pegged at 24¼¢/-lb. for crystal material and 27¼¢ for color. Cosden's quotes, based on "zone" distances from Big Spring, are less. But here's the catch, say established sellers: Cosden's conditions call for bulk-buying—400,000 lbs. minimum—and all of one formulation. Such quantities would require expensive handling equipment and a mass-produced product line. Few U.S. molders are big enough to meet the qualifications, which explains why unanswered questions are being bruited about the industry.

Cosden president, R. L. Tollett, told *CW* that his polystyrene plant is now in a "shakedown run; operations are a little rough, not yet up to capacity." The company has lined up "some customers," but sales won't start until an inventory for backlog has accumulated.

•

U.S. polyester resin capacity gets a boost this week. Pittsburgh Plate Glass will start turning out "dimer polyester," specifically tailored for urethane foam use, at its Ditzler Color Division (Detroit, Mich.) plant. It may produce at least 2 million lbs./year.

•

Kansas joins the roster of benzene-producing states with first shipment of the aromatic out of Vickers Chemicals' new, $3.5-million Potwin, Kan., plant. Recipient: Frontier Chemical's Wichita plant—for benzene hexachloride manufacture. Toluene, xylene and other petroleum aromatics will also be made at Potwin. Total aromatics capacity: about 15 million gal./year.

SELECTED PRICE CHANGES — WEEK ENDING JUNE 16, 1958

	Change	New Price
DOWN		
Acetophenone, tech., dms., l.c.l., wks.	$0.3725	$0.3775
Copper cyanide, tech., dms., 20,000 lbs. or more	0.025	0.609
Methyl parathion, tech., 80%, dms., c.l., frt. alld., East	0.07	1.18
Potassium cyanide, dms., small lots, wks.	0.025	0.44

All prices per pound unless quantity is stated.

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for organic synthesis and polymers

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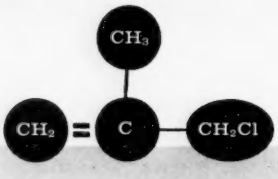


Typical Properties

Assay: 95%

Colorless liquid, pungent odor

Sp. Gr. 20/20°C: 0.926

Boiling Point (760 mm): 72.2°C

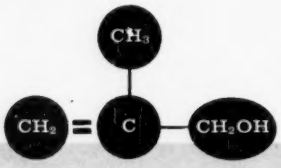
Freezing Point: Below −80°C

Flash Point, Tag open cup: 14°F

Solubility: Miscible with many organic solvents; less than 0.1 wt. % in water.

Commercially Available

ALCOHOL



Typical Properties

Assay: 98%

Colorless liquid

Sp. Gr. 20/20°C: 0.852

Boiling Point (760 mm): 114.5°C

Flash Point: 92°F (approx.)

Solubility: Soluble in water and in a variety of organic solvents.

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Reactions and Uses

- Active double bond for halogenation, sulfonation, nitration, hydrohalogenation, etc.
- Useful as monomers and co-monomers for preparation of adhesives, protective coatings, castings, laminates, novel polyesters and other products.
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- In preparation of grain fumigant compositions.
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Denison Dam, one of northeast Texas' conservation projects, helps control area's water problems.

Water: Boon and Bane to N.E. Texas CPI

From Denison Dam down to Dallas—as elsewhere in northeastern Texas this spring—flash floods brought their usual headaches; and drought may be the complaint in late summer. It's this problem of periodic flood and drought that government and industry are both trying to cure. Object: to lure more chemical process companies to the area.

The northeast Texas square, bordered on the north and east by the Texas state lines and by lines running south from Wichita Falls and west from Burkeville to intersect at Rockdale (*see map, p. 106*), has already attracted a variety of chemical companies. In the opinion of local boosters, it has the natural and economic advantages to lure many more plants to the raw materials-rich region.

Even now, during a nationally felt depression, no one seems to be hurting. Indeed, according to Dan Wooten, president of Dallas' First National Bank, "East Texas is prosperous. Agriculture, which includes the cattle business, is in better condition than it has been at any time during the last decade. Lumber prices have improved and construction has gained in volume. Oil production is still low and some refineries are not running full-time; even so, there is indication of improvement in the oil industry."

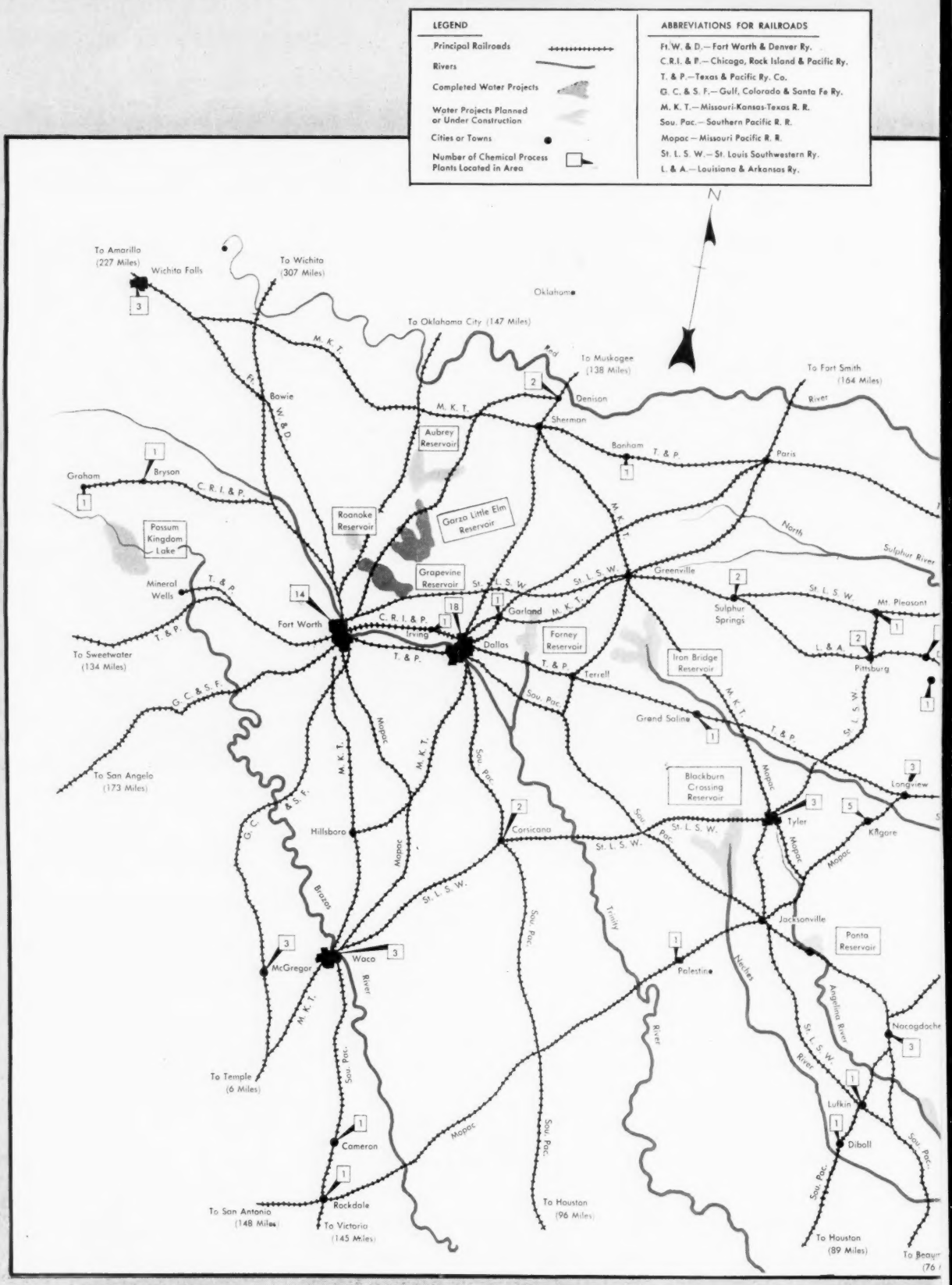
Not Depressed: The Longview-Tyler-Texarkana area has not been affected to any great extent by the general recession, a survey showed last week. Manufacturing employment has shown little weakness the past spring; and in chemicals, there has been actually a sizable gain during the period. The only sour note has been in the oil industry.

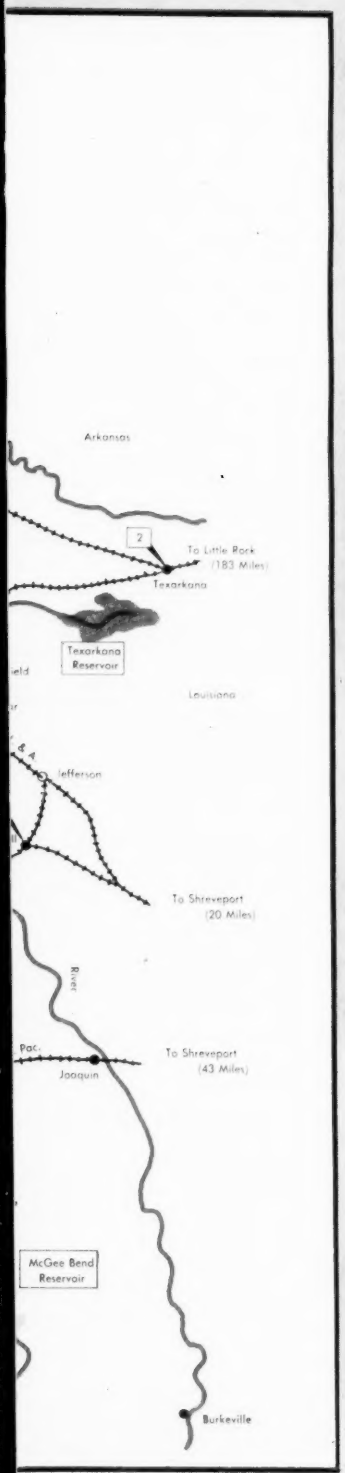
CW's reporter was told, "Chemical management in this section of the state is looking forward to further improvement, especially from the standpoints of manufacturing and employment, during the latter half of the year."

Over the long term, northeast Texans are equally enthusiastic. Contributing largely to this feeling are a number of factors of particular interest to process firms. They include:

• Far-reaching programs, both planned and under way, to mitigate

ADMINISTRATION





The CPI in Northeast Texas

Bonham
- Hi-Yield Fertilizer Co.

Bryson
- Bryson Pipeline & Refining Co.

Cameron
- Southland Cotton Oil Co.

Corsicana
- American Rockwool Co.
- Chattanooga Glass Co.

Daingerfield
- Lone Star Steel Co.

Dallas
- Acme Quality Paint, Inc.
- Armour Fertilizer Works
- C. H. Draggert Co.
- Fleming & Sons
- H. B. Fuller Co.
- Hooker Chemical Corp.
- Jones-Blair Paint Co.
- Lambert Corp.
- Linde Air Products Co.
- Martin-Senour Co.
- Minnesota Paint Co.
- National Cylinder Gas Co.
- Procter & Gamble Mfg. Co.
- Pure Carbonic Co.
- Purex Corp.
- Sewall Paint & Varnish Co.
- Sherwin-Williams Co.
- Trinity Oxygen Co.

Denison
- Conway Oil Co.
- Denison Peanut Co.

Diboll
- Southern Pine Lumber Co.

Fort Worth
- American Cyanamid Co.
- American Printing Ink Co.
- Armour & Co.
- Cardox Corp.
- Consolidated Chemical Industries
- Gillam Soap & Chemical Co.
- Int. Minerals & Chemical Corp.
- Marco Chemical Co.
- National Cylinder Gas Co.
- Panther Chemical Co.
- Premier Oil Refining Co.
- Spencer Chemical Co.
- Trinity Oxygen Co.
- Trinity Portland Cement Co.

Garland
- De Soto Paint & Varnish Co.

Graham
- Gratex Corp.

Grand Saline
- Morton Salt Co.

Irving
- Petrocarbon Chemicals, Inc.

Kilgore
- Dallawax
- H. O. Meissner Co.
- Petrolite Corp.
- Warwick Wax Co.
- Wrather Petroleum Co.

Lone Star
- Reilly Tar & Chemical Corp.

Longview
- Premier Oil Refining Co.
- Skelly Oil Co.
- Texas Eastman Co.

Lufkin
- Southland Paper Mills

Marshall
- Atlas Powder Co.
- Thiokol Chemical Corp.

McGregor
- Astrodyne, Inc.
- Petrolite Corp.
- Phillips Petroleum Co.

Mt. Pleasant
- American Petrofina Co.

Nacogdoches
- Bennett & Clark
- Lone Star Phosphate Co.
- Texas Farm Products Co.

Palestine
- Knox Glass Co.

Pittsburg
- Peerless Carbon Black Co.
- Pittsburg Fertilizer Co.

Rockdale
- Aluminum Co. of America

Sulphur Springs
- A. P. Green Firebrick Co.
- Red Star Fertilizer Co.

Texarkana
- Farmers Fertilizer Co.
- Int. Minerals & Chemical Corp.

Tyler
- American Clay Forming Co.
- East Texas Products Co.
- La Gloria Oil & Gas Co.

Waco
- General Tire & Rubber Co.
- Owens-Illinois Glass Co.
- Universal Atlas Cement Co.

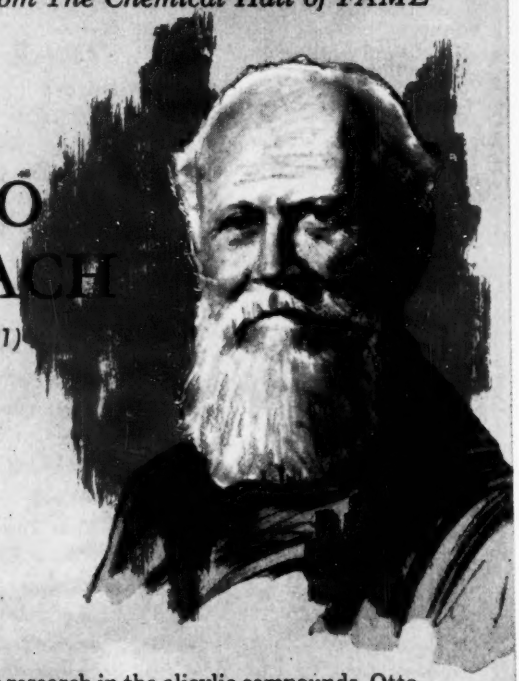
Wichita Falls
- Continental Oil Co.
- LaSalle Petroleum Corp.
- Panhandle Oil Refining Co.

Story continued on p. 108 ➡

Excerpts From The Chemical Hall of FAME

OTTO WALLACH

(1847-1931)



For pioneer research in the alicylic compounds, Otto Wallach received the Nobel Prize in 1910. It was his investigations in the field of organic chemistry which laid the groundwork for aromatic chemicals.

By 1910 Foremost's El Dorado Division had been pioneering in the field of coconut oil and its by-products for 18 years, and had established an enviable reputation for purity and uniformity in its products.

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In New York: H. Reisman Corp.

the ups and downs of water supply.

- Large quantities of raw materials that are just now being vigorously promoted.
- Favorable financial and labor conditions for development of heavy-capital industry.
- An existing core of well-established process industries with potential as both suppliers and users of chemical process products.

Water: Surface water presently available is now more than adequate for industry, and reservoirs and dams under construction or in the planning stage will increase the supply materially. Various agencies are making plans for as far in the future as 2000. Underground water resources have never been fully measured, but are considered to have been extremely valuable in the area's economic development.

Rainfall measures give a rough approximation of water supply in the area. It is heaviest along the Eastern border where the annual fall is 50 in., diminishes in a westerly direction at the rate of about 1 in. every 17 miles.

In the Eastern part, several rivers contribute large runoffs. They are the Sabine, Neches, Angelina, Trinity, Red and Sulphur rivers. They will supply many reservoirs. Surface water is of high quality, relatively soft, with low turbidity and low salt content. It is obtainable at low cost, in some cases as low as 2¢/1,000 gal. of raw water at reservoir sites.

Besides the water control projects, there are plans for enhancing the transportation system. It's hoped that eventually the intercoastal water way will have an extensive loop that will connect New Orleans with Shreveport, the Red River and thence down the Trinity with Galveston. Realization of these plans, however, is still far in the future. Incidentally, numerous railroads provide a large network of transportation facilities through the area. Moreover, the highways are excellent.

Raw Materials: Texas is usually associated with gas and oil, and the importance of these industries in the region is obvious. Moreover, they have stimulated development of such other industries as steelmaking and processing of crude oil and gas. These industries, drawing from fields in much of northeast Texas, constitute a key

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Melting Point (ring and ball)	112°C.
Acid Number	94
Saponification Number	165
Gasoline Insoluble	83%
Oxygen Absorption	0.25%

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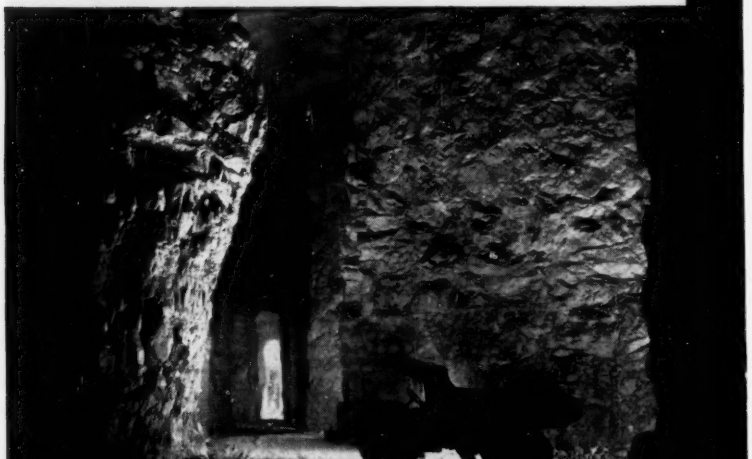

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MISSISSIPPI LIME COMPANY
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factor in the region's chemical development over the years.

Salt is another important commodity, first produced at Grand Saline in 1845. Five salt domes in the Grand Saline area are principal sources, but brine is also pumped at seven locations south of the area. Limestone, too, is readily available throughout the region. Most of it is found in outcrops of the Cretaceous strata, which span the area on a North-South strike; purest is in the Edwards formation—extending roughly southward from Fort Worth past Waco—where some samples have assayed 99.4% calcium carbonate. Such relatively pure limestone is available in virtually unlimited quantities.

Coming up in importance is lignite —so-called brown coal. In the past, its major use has been to meet domestic and industrial solid fuel needs and as a raw material for the production of activated carbon. Aluminum Co. of America is already heavily capitalizing on lignite for fuel at its aluminum reduction plant near Rockdale. It's hoped, however, that several projects now under active development will lead to lignite's use (other than as fuel) in metallurgical and chemical processes.

Texas Power & Light Co., which supplies much of the electrical power in the region and has developmental access to more than a third of a billion tons of lignite near Palestine, is working to bring together steelmakers—via the Udy process—and chemical processors interested in extracting electrode-quality coke, pitch and other chemicals from the brown coal. One likely prospect: lignite-based acetylene as a raw material.

Fostering another area of growth —manufacture of edible oil and fertilizers—is the program of Texas Research Foundation. It is seeking to develop the growth of soybeans and sesame in the region. Several hardy and adaptable strains have been worked out that will grow well in the northeast Texas climate.

Labor and Taxes: Labor availability is good. U.S. Dept. of Labor figures indicate that about 97% of the population is native-born American stock, presenting no language barriers. Manufacturers moving into the area have found an adequate supply of local workers who readily adapt to new ideas and skills. There have been few

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- Exceptionally high densities of bromine compounds.
- Catalytic properties of various inorganic bromides in reactions involving intramolecular rearrangements.

New product opportunities:

- Bromine imparts greater fire resistance to organic compounds than low molecular weight halogens.
- New pharmaceuticals are possible with bromine compounds as intermediates.
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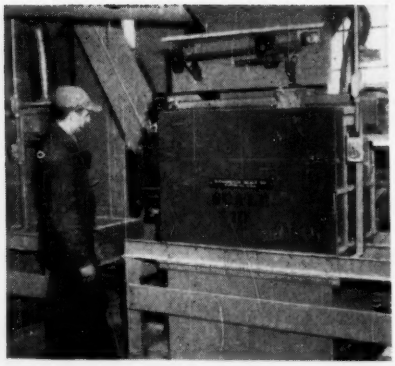
† A joint-venture project of Michigan Chemical Corporation and Murphy Corporation of El Dorado, Arkansas

Why Richardson bulk scales are important to your profit and loss picture



Losses you eliminate—On bulk handling it's important to know that you're getting all you paid for, not for material lost in transit. Likewise in batching and proportioning, a Richardson Bulk Scale gives you exact control over all ingredients. Accurate to 1 to 3 oz., these top-quality scales end weight "give-away" of expensive materials.

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ADMINISTRATION

instances of local work stoppages. As to taxation, Texas has no state corporation income tax, general sales tax, nor individual income tax. This favorable environment is at the cost of substantial severance taxes levied on resources produced in the state. They provide nearly one-third of total tax revenues. Property taxes are based on county assessments customarily ranging between 15 and 25% of actual value, making the levy a nominal one.

Industrial core: A glance at the list of companies in northeast Texas (*see p. 107*), shows a wide variety of process firms already there, marketing products ranging from oil and gas to missiles and rocket materials. These companies provide a hard core of potential suppliers and buyers of process products for almost any of the chemical process industries that might locate there.

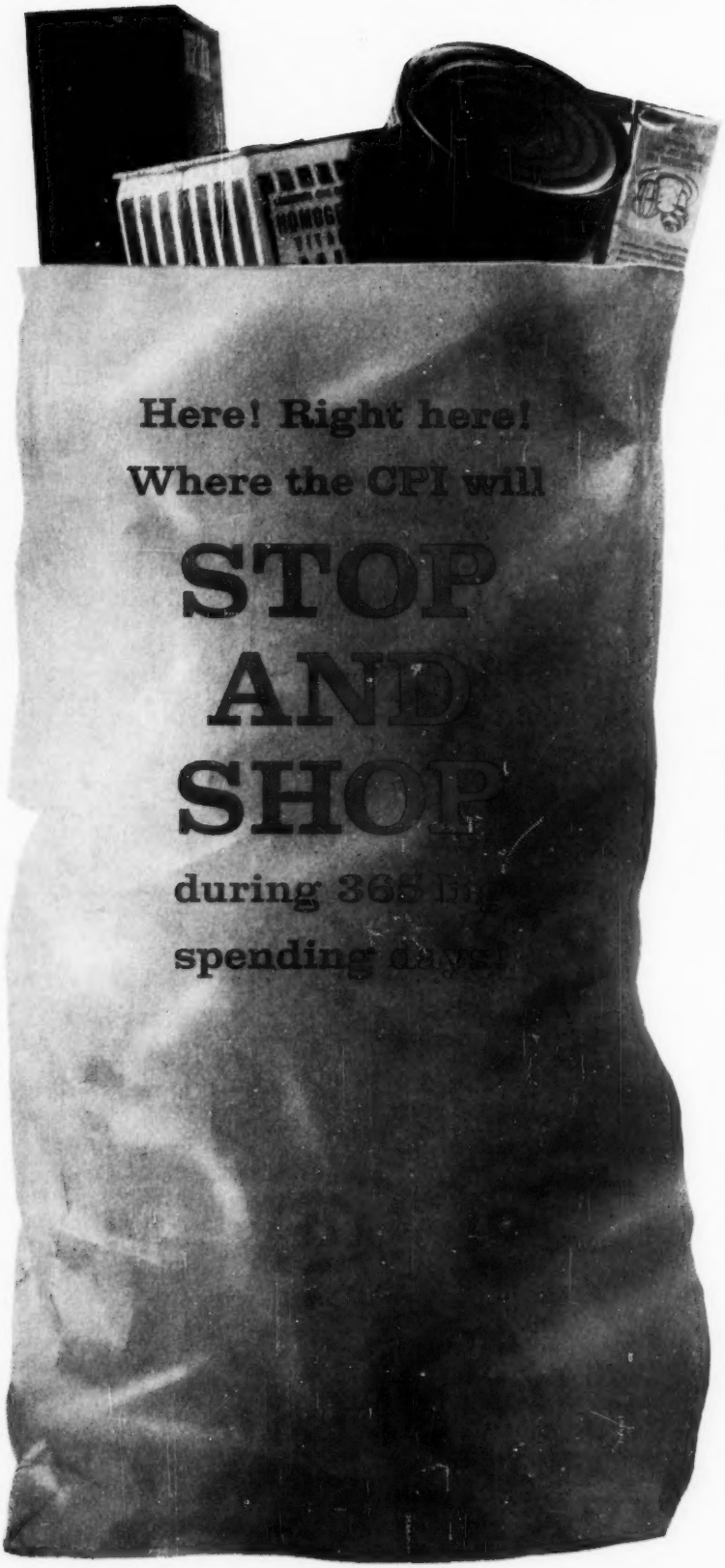
LEGAL

Another Fluoride Pollution Suit: A Polk County, Florida, cattleman has entered suit against all but one of the eight phosphate producers in the county, charging fluoride pollution damage to his stock and land, and asking $500,000 in damages.

The suit was brought by Doyle M. Acree in federal district court (Tampa) against International Minerals & Chemical Corp., Swift & Co., Virginia-Carolina Chemical Corp., Armour & Co., F. S. Royster Guano Co., Davison Chemical Co., a division of W. R. Grace & Co., and American Agricultural Chemical Co. (American Cyanamid, another phospate producer, was not named). The suit follows by only a few months the creation of Florida Air Pollution Control Commission and establishment of a control district in Polk County.

Acree alleges that he lost 175 head of cattle—his entire herd on a 1,000-acre ranch—because of fluoride pollution of the herbage. William Carver, Acree's attorney, told *CW* that "all Polk County ranchers are up in arms over the (pollution) situation."

The pollution commission, under the direction of T. H. Lipscomb, is conducting a state-financed, $65,000 study of 200 sq. miles of the area to determine the cause of fluoride poisoning. Whether the poisonous substance comes from dust, gaseous mat-



If the Chemical Process Industries bought everything it uses out of its own super Sears Roebuck catalog... well, that would cover $5 billion for new plants and equipment – plus more than $48 billion for raw materials, fuels, energy and contract work. A total market of over $53 billion... Wow!

But, of course, there are lots of things that CPI-Management can't buy out of a book...complete as the Chemical Week BUYERS' GUIDE might be. So, you'll have to set your own net worth on this virtually indispensible volume ...and whatever your minimum figure, you'll have to admit it holds a terrific dollar potential for you.

Every user benefit pays you a bonus. And it's loaded with them...12 directories-in-one...over 7,000 product listings...over 400 pages of helpful advertising. So why should the buyer clutter his desk with other sources when he has one so complete? Research confirms this–74% of the recipients of the BUYERS' GUIDE actually prefer it to any other catalog or directory.

And best of all – its coverage keeps climbing – currently over 38,000 circulation...40,000 by the time the '58 issue will be out. It's the regular "management men in all functions" paid subscriber audience of Chemical Week – not a hit or miss special list. And you already have – or can get awfully fast – a barrel of bonafide evidence on management's priority in most buying decisions.

Next edition you can get space in – September 1958. Just take the precaution to plan your BUYERS' GUIDE space *right now*...make your reservation for the 1958-'59 issue *right now!*

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KEY CHANGES

L. F. Loutrel to board chairman, and **James W. Dunham** to president, Midwest Carbide Corp. (Keokuk, Ia.).

Bernard Kopelman to director of market development, Sylvania-Corning Nuclear Corp. (Bayside, Long Island, NY.).

Presson S. Shane to director, new Solid Propellant Division, Atlantic Research Corp. (Alexandria, Va.).

Irwin Goldman to associate director of research—chemistry and metallurgy; Sylvania Research Laboratories (Bayside, N.Y.), division of Sylvania Electric Products (New York).

George B. Stone to general manager, J. B. Roerig and Co., division of Chas. Pfizer & Co. (Brooklyn, N.Y.).

James N. Cooke to president, National Brands Division, Sterling Drug, Inc. (New York).

Floyd A. Eberly, R. T. Parfet, Jr., and **Preston S. Parish** to vice-presidents, Upjohn Co. (Kalamazoo, Mich.).

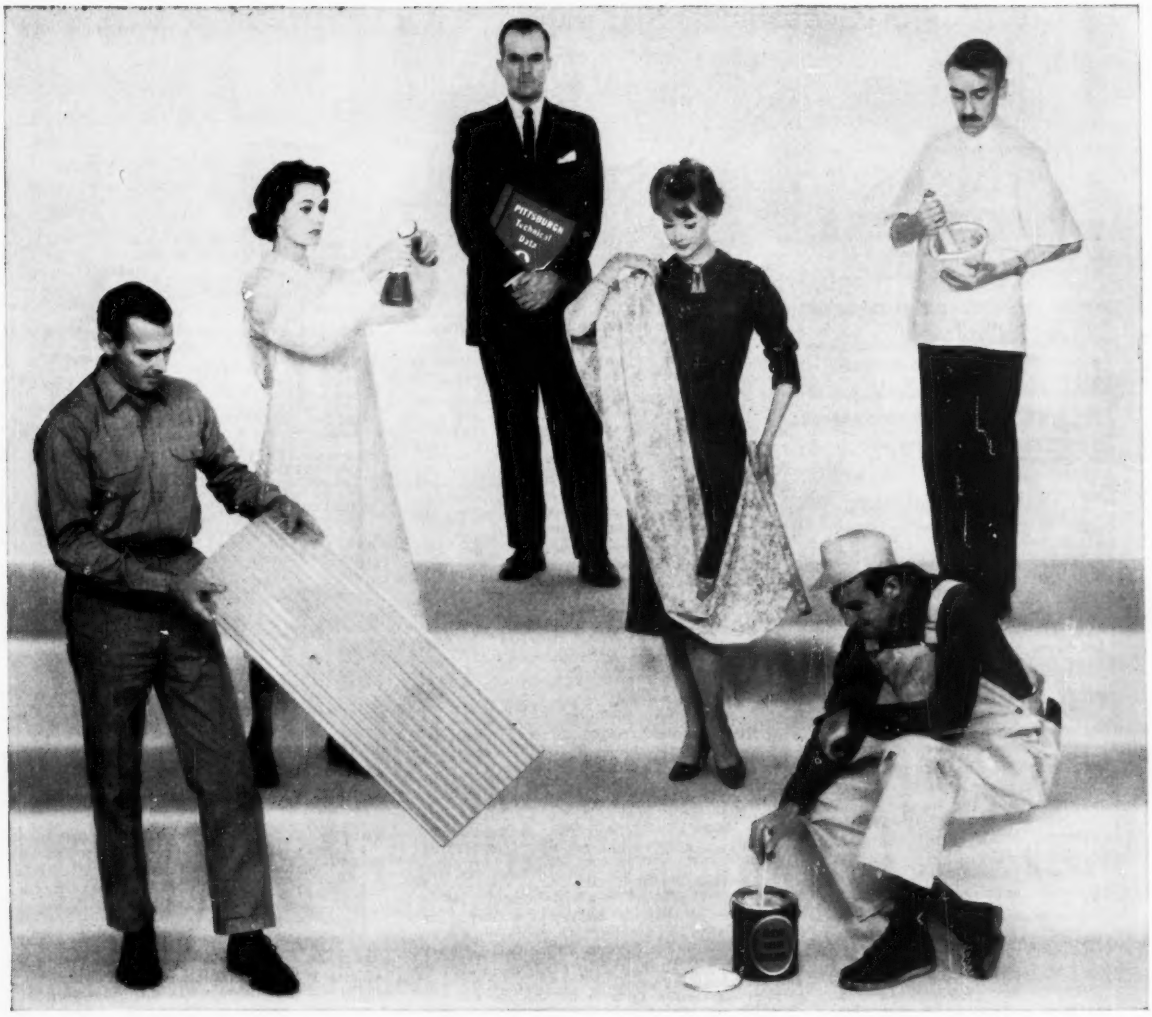
Kenneth E. Walker to director, new Planning and Cost Control Division, Michigan Chemical Corp. (St. Louis, Mich.).

KUDOS

To **Eli Lilly,** board chairman, Eli Lilly and Co., the 1958 Remington Honor Medal of American Pharmaceutical Assn.

DIED

David A. Douglas, 57, cofounder, Warren-Douglas Chemical Co. (Omaha, Neb.).



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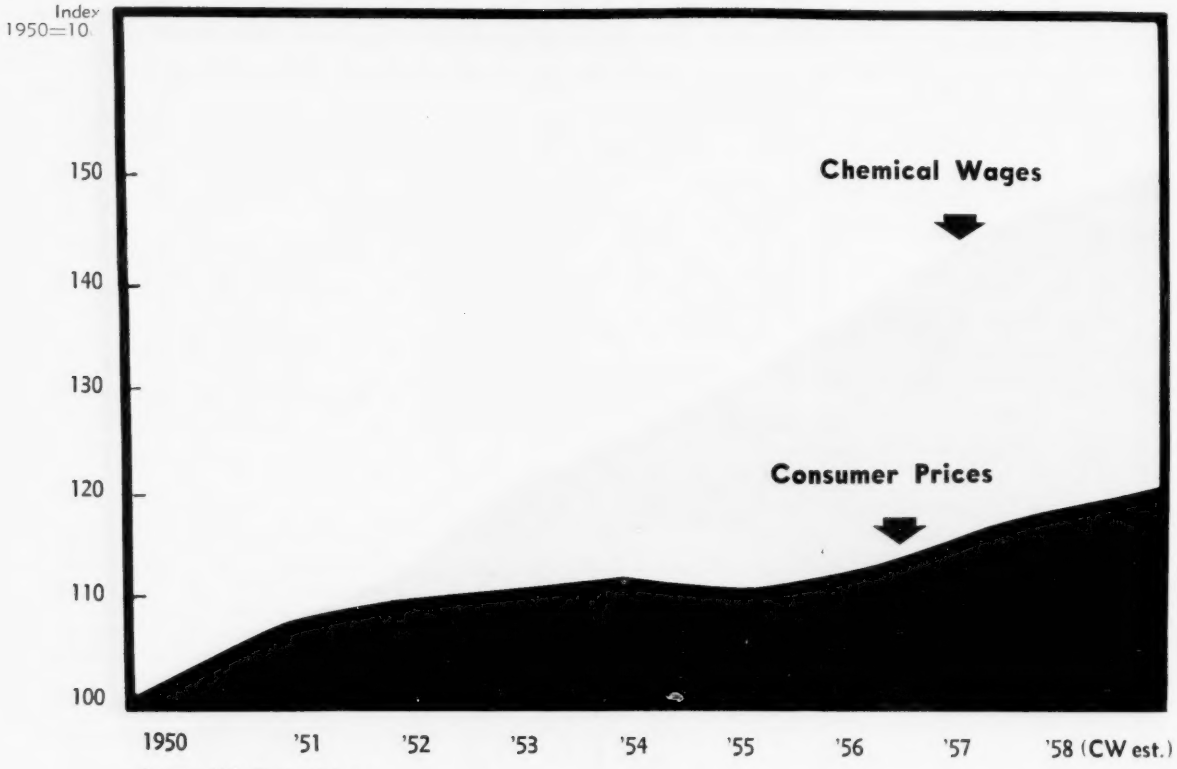

Source: U.S. Dept. of Labor.

CPI Pay Outclimbs Rising Living Costs

The average weekly paycheck of a chemical worker this year will likely hit $93—an increase of more than $30 over his 1950 weekly average of $62.67. In eight years, chemical wages have outstepped cost-of-living rises almost three to one.

During the first two years of the eight-year period charted above, chemical workers' earnings increased at a particularly rapid pace. But the rise in wages was accompanied by an equally sharp hike in consumer prices.

Between 1952 and '55, consumer prices remained relatively stable, while average earnings spiraled upwards—so much so that, since 1952, the average earning power of those in the chemical and allied industries has increased about $2.80 for each dollar increase in cost of living.

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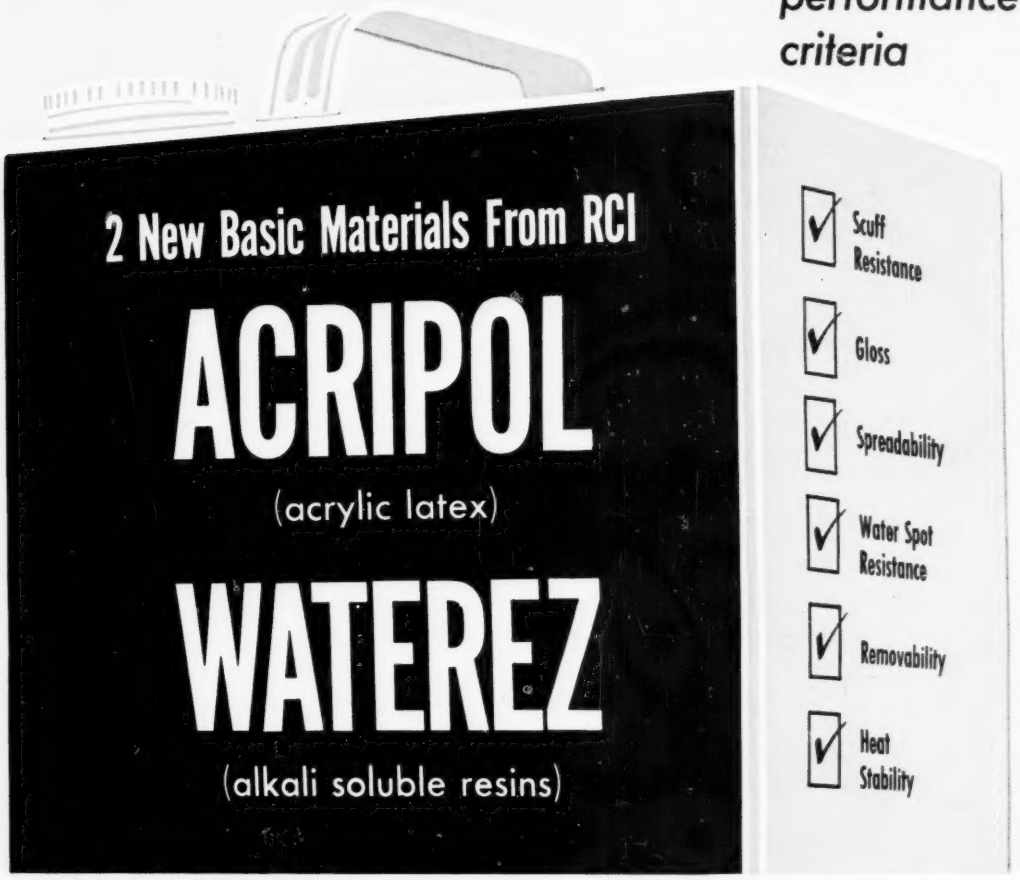

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This acrylate copolymer latex has been designed to satisfy the exacting requirements of the floor polish industry. Its relative hardness simplifies formulation of scuff-resistant polishes. Its outstanding ability to rest on the surface rather than be dissipated into the pores of the substrate permits higher gloss. A second factor responsible for gloss is the ready ability of the plasticized ACRIPOL resin particles to coalesce into a continuous film. Formulated with WATEREZ and wax, ACRIPOL offers a manufacturer the widest possible range in which all six self-polishing floor wax performance criteria may be met simultaneously.

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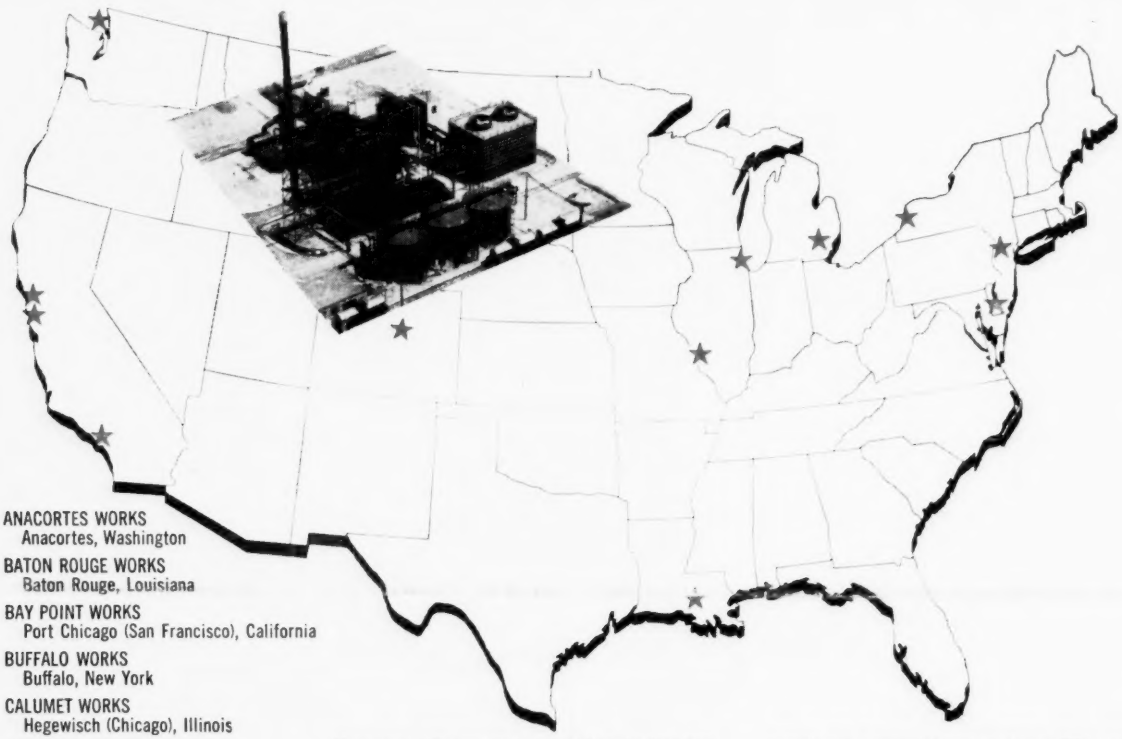

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